MODEL LAND USE PLAN OF BAREILLY DISTRICT

Sponsored by:

STATE LAND USE BOARD
DEPARTMENT OF PLANNING
GOVERNMENT OF UTTAR PRADESH

Conducted by:

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PREFACE

The availability of land for various uses is limited. Therefore, utilization and conservation of land resources are important for their sustainable use. Formulation of Model Land Use Plan is an important step for promoting a desirable land use. With this view, State Land Use Board, Department of Planning, Government of Uttar Pradesh, entrusted the Giri Institute of Development Studies, Lucknow to prepare Model Land Use Plan for six districts of Uttar Pradesh, namely, Lucknow, Kanpur, Bareilly, Moradabad, Meerut and Agra. The present report is the Model Land Use Plan of Bareilly Agra district.

We are highly obliged to Shri S.N. Jha, IAS, the then Principal Secretary, Department of Planning, Government of Uttar Pradesh for sponsoring the task to our Institute. Mr. Anis Ansari, IAS, who has been the Principal Secretary, Department of Planning, after Shri Jha, provided us very useful guidance. We are extremely grateful to Shri Amal Kumar Verma, IAS, the present Principal Secretary, Department of Planning for his valuable guidance on the subject. We feel grateful to Shri Kunwar Fateh Bahadur, IAS, and Shri Navtej Singh, IAS, Secretary, Department of Planning for their guidance and encouragement. We are also extending our thanks to Shri A.N. Mishra, IAS, Special Secretary, Planning for his continuous support in pursuance of the study.

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The research team of the Institute consisting of Ajai Kumar Singh, Mohd. Kaleem, Ravi Nigam, Vinay Kumar Bisht, Zamir Ahmad, Shubhra Tandon, Sanjai Sharma and Ms. Sweta Yadav remained involved in data collection, processing and computerization. All of them did their job efficiently and deserve our appreciation. Last but not the least, Shri Manoharan K. deserves our thanks for word processing the manuscript efficiently.

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GEO-PHYSICAL CHARACTERISTICS

The district of Bareilly (also known as Bareli or Bans Bareli) forms a part of the Rohilkhand Division and is named after its headquarter city which is also the Divisional headquarter. The district came into existence about the beginning of the sixteenth century. Tradition has it that it was founded in 1537 by Bans Deo and Barel Deo, the two sons of Jagat Singh Katehriya who had founded the village of Jagatpur which is still the name of a locality in the old city. Another version recounts that Jagat Singh was a Barhela Rajput who had two sons, Bans Deo and Nag Deo, the former having built a fort in 1550 which was named Bans Bareli and the latter founding the city, the remains of the fort still being traceable in the locality known as Kot (meaning fort). The prefix 'Bans' might have been added because of the numerous bamboo groves near the city

I.1 LOCATION AND AREA

I.1.1 LOCATION

The district lies between Lat. 28°1' and 28°54' N. and Long. 78°58' and 79°47' E. Its maximum length from north to south is about 99 kilometres and its maximum breadth from east to west about 78 kilometres. The northern boundary of the district is contiguous with that of Udhan Singh Nagar. On the east lies the district of Pilibhit and on the south-east the district of Shahjahanpur. On the south and south-west it is bounded by the district of Badaun, the Ramganga forming the natural boundary between the two districts for about 29 kilometrs and on the west lies the district of Rampur.

I.1.2 AREA

According to the district records the area of the district was 4120 square kilometres in 1991. It stands forty-fifth in the State in respect of area. The area of the district fluctuates from year to year on account of changes in the course of the Ramganga.

I.2 TEHSILS AND BLOCKS

There are six tehsils and fifteen blocks in the district. The names of these tehsils and blocks and their distance from the district headquarter is as follows:

Table I.1 : Tehsils and Blocks in Bareilly District

Sl. No.	Tehsils	Blocks	Distance from District Headquarter
1.	Baheri	Baheri	50
		Sergadh	42
		Damkhoda	46
2.	Mirganj	Mirganj	33
		Phatehganj (W)	25
3.	Bareilly	Bhojipura	17
		Kyara	6
		Bithari Chainpur	13
4.	Aonla	Ram Nagar	51
		Majha Gawan	26
		Alampur Jafra	22
5.	Nawabganj	Nawabganj	33
		Bhadpura	55
6.	Faridpur	Bhuta	34
		Faridpur	22

I.3 TOPOGRAPHY

The district is almost an open plain with slight undulations which are more pronounced in the south, the surface being diversified by numerous river valleys. The

general slope is from north to south with the exception of the tahsil of Aonla where it is from west to east, the highest elevation above sea level, as recorded on the Nainital—Bareilly border, being 658.7 feet and the lowest, as recorded in the southeast at Fatehganj East in tahsil Faridpur, 520.3 feet. In the northern half of the district there is hardly any difference in the average elevation of the different places lying in the same latitude.

The district may be divided into four physical units-the *tarai,* the *des,* the *bangar* and the *khadar.*

I.3.1 The Tarai

This tract, locally known as *mar* extends in a narrow belt along the northern villages of the parganas of Chaumahla and Richha and is the continuation of the sub-himalayan forest belt which at several places advances to within few kilometres of the northern border of the district. In the past it extended as far as Kabar but now there is very little forest left. Though rich in humus, *tarai* soils are generally ill drained. The water-table is high and the water-logged subsoil combined with the high rainfall makes this tract unhealthy and inhospitable.

I.3.2 The Des

This tract, comprising the central portion of tahsil Baheri, lies to the south of the t*arai* and is locally known as the *des* which merges in the upland *bangar* to the south. The soil here is fertile loam with very little admixture of sand. It slopes towards the south and south-east as is evident from the course followed by the rivers, the large number of which forms the dominant characteristic of the tract.

I.3.3 The Bangar

To the south of the *des* lie the extensive tracts of *bangar* or old alluvium upland which is much higher than the alluvial flood plain (or *khadar)* and forms the inter-stream divides or watersheds. The *bangar* soils differ in composition and fertility and become light in texture towards the south and south-east, sand-hills predominating in tahsil Faridpur. In the northern part of tahsil Aonla and to the south of the Ramganga *khadar,* the upland dwindles into a series of isolated ridges covered with light shifting soil which, under the action of the west winds, is frequently blown away to expose the hard substratum of day.

I.3.4 The Khadar

The *khadar* or new alluvium of the river valleys is rather limited except that of the Ramganga, the Deoha (on the eastern border), the Bahgul (East) in its lower courses in tahsil Faridpur, the Nakatia near Bareilly and the Bahgul (West) near Shahi. It is usually a very fertile tract and is commonly utilised for growing vegetables, the finest wheat and sugarcane. On the whole the flood plain of the Ramganga is 6 to 7 kilometres wide but is as wide as 26 kilometres in the tract between Bareilly and Aonla. It generally merges in the *hangar* upland imperceptibly except near Sirauli and a few adjacent villages where the Danks are well-defined, the cliffs actually overhanging the river. The *khadar* of the Deoha is also very fertile and is a strip about one and a half kilometres wide which extends 16 kilometres along the eastern border of tahsil Nawabganj and for 6 kilometres along the eastern boundary of tahsil Faridpur. The *khadar* in the lower reaches of the Bahgul (East) in pargana Faridpur is about 1.5 kilometres wide and is locally known as *chanda.* The *khadar* of the Nakatia near Bareilly and that of the Bahgul (West) near Shahi are also extensive and fertile.

I.4 RIVERS AND WATER RESOURCES

The main river of the district is the Ramganga which enters the district from the west and flows south east, separating tahsil Aonla from the rest of the district. The other rivers, the Siddha, the Dojora, the Bahgul (West), the Sankha, the Deoranian and the Nakatia and their tributaries, which mostly rise in the *tarai,* generally run through the district in southerly and south-easterly directions to join the Ramganga. The Bahgul (East) and the Deoha the former running through the district and the latter only touching its eastern boundary for about 25 kilometres, leave the district near Fatehganj East and Mahalia Jalalpur respectively. The Aril, with its tributaries, flows through tahsil Aonla.

I.4.1 Ramganga

Rising in the mountains of Garhwal, the Ramganga, a great tributary of the Ganga, enters the district from district Rampur near Dhimar Patti, a deserted village in tahsil Bareilly. It then flows in a south-easterly direction past Sirauli- and Sheopuri, separating tahsil Aonla from the tahsils of Bareilly and Faridpur as far as Sipahia. It then forms the boundary between the district and that of Badaun as far as Saidpur where it again enters the district and, running through it for about 5 kilometres, again forms the boundary between the district and that of Badaun, finally leaving the district near Manpur. After being fed by many streams it becomes much larger and carves out fresh channels through the alluvium. The banks are well-defined near Sirauli and a few adjacent villages, the cliffs actually overhanging the river during the floods. Elsewhere they descend in little vertical steps. In the *khadar* of tahsil Aonla there are numerous abandoned old channels. To the west of Bareilly there are two channels several kilometres apart and the river keeps shifting from one to the other and cutting into the land in between. It cannot be used for irrigation owing to the breadth of the *khadar* and the depth of -the channel below the level of the

upland and, though usually navigable by vessels of small draught, *becomes* fordable at many places during the hot season.

I.4.2 Siddha

This stream (which rises in the Shahabad pargana of district Rampur) is the first tributary of the Ramganga in the district which it enters near Shamshpur, a village (in tahsil Bareilly) on the western border of the district. It then flows in a south-easterly direction through pargana Sirauli (in tahsil Bareilly) in a tortuous course and joins the Ramganga near Labhera Purohit. It has well-defined banks, which are sometimes sloping and sometimes abrupt. During the rainy season it often overflows its shallow bed, the flood causing much damage to the crops in the neighbouring villages. The tracts along its banks retain their moisture but when necessary its water is utilised for irrigation. It is joined by three rivulets, the Pila, the Hurhuri and the Sila, all of which drain the northern lowlands of pargana Sirauli (in tahsil Bareilly).

I.4.3 Dojora

This river is formed, 1.5 kilometres west of Khirka , by the union of the Bhakra and its tributary, the Dhakra (on the west) and the Bahgul (West) and its tributary, the Dhora, on the east, from which phenomenon it gets its name (meaning two pair). Flowing southward in a sinuous course, it joins the Ramganga near Bazpur in pargana Sirauli (in tahsil Bareilly). Its banks are high but it is occasionally utilised for irrigation purposes in exceptionally dry years.

I.4.4 Bhakra

This stream enters the district from the district of Rampur near the village of Bhurasi on the western border of the district and runs southward till it reaches the village of Meondi

Buzurg in tahsil Baheri. It then forms the boundary between the tahsils of Baheri and Bareilly for about 3 kilometres as far as Bansipur (in tahsil Bareilly) where it turns west and after running for about a kilometre and separating the 2 tahsils it enters tahsil Bareilly and flows towards the south as far as Jauner. Then it is joined by the Dhakra. Flowing southwards for about 3 kilometres and then nearly one kilometre towards the west, it runs in a south-easterly direction for about 13 kilometres till it meets the Bahgul (West) to form the Dojora.

I.4.5 Dhakra

This river touches the district about one kilometre northwest of Paltha (in tahsil Baheri) and, after forming the western boundary of the district for about 4 kilometres enters the district about a kilometre south-west of the village where the tahsils of Bareilly and Baheri and the district of Rampur meet. Then flowing in a winding course, it joins the Bhakra on the right near Jauner.

I.4.6 Bahgul (West)

This stream rises in the *tarai* area and first touches the district near Mandaiyan. After forming the boundary of the district for about a kilometre, it leaves it but retouches it at Chubakia only to leave it once again. Separating the district from that of Rampur for about one and a half kilometre, it enters the district near Bhairpura. Near Narswa it is joined by the Barai and runs southward for about two kilometres. It then again forms the boundary between the two districts till it reaches Khamariya where it re-enters the district through which it flows for about 3 kilometres. Then, once again separating the district from that of Rampur it re-enters the former near Dhakia. It is joined by the Baraur at Rustamnagar and flowing in a south-westerly direction it is first joined by the Kichha and then by the Kuli near

Lakshmipur and Basal respectively. From this point onwards it flows in a southerly direction and is joined by the Dhora at Bafri Abdul Nabipur from where it again runs south-westward till it meets the Bhakra near Khirka to form the Dojora.

I.4.7 Baraur

Rising in the *tarai* area, this stream enters the district near Chachahit where it has been dammed to provide irrigation on its right flank. It is fed by several small streams (including the Barai and the Madmi) and being thus strengthened it has been dammed again near Manpur just before its junction with the Bahgul (West) to irrigate the area lying between the Bahgul (West) and the Khalwa.

I.4.8 Kichha

This stream (known as the Gola in its upper course, till it reaches the Tarai) enters the district near Mundia Mubarrakpur, a village on the northern border of the district in pargana Chaumahla (in tahsil Baheri). It then winds through the parganas of Chaumahla and Kabar towards the south-west and is joined on its right bank by the - Khalwa (a small stream) near Gularia. It joins the Bahgul (West) near Lakshmipur (in pargana Kabar). Generally the river is of small dimensions except during the floods when it rises 10 feet or more attaining a surface velocity of 11 kilometres an hour. Its banks are high, being usually abrupt on one side and shelving on the other. Its bed is shallow, wide and sandy and so full of quicksand that it is difficult to cross even at the usual fords.

I.4.9 Kuli

The Kuli, which is a tributary of the Bahgul (West), touches the district near the village of Kanakpuri (in pargana Sarsawan) and separates the district from that of Rampur for about two kilometres. It then winds south-westwards and joins the Bahgul (West) on

the right near Basai where it has been dammed to provide irrigation to the lands lying west of the Bahgul (West).

I.4.10 Dhora

Rising in the *Tarai* region, this stream enters the district near Madhupur (in pargana Chaumahla) after forming the northern boundary of the district for about two kilometres. It then flows southward as far as Bijauria near which it enters pargana Richha where it has been dammed near Jasainagar. From here it flows on in a southwesterly course through the western part of the pargana. It leaves tahsil Baheri near Kurka and after separating the parganas of Shahi and Kabar for a short distance and then flowing through the former, it joins the Bahgul (West) on the left near Bafri Abdul Nabipur. Its bed and banks are of clay and its normal discharge is small except during the rains when, occasionally filled by a spill from the Gola (Kichha), it carries a large volume of water, the level rising 10 feet above the normal. It is extensively utilised for irrigation and its waters are especially suitable for the cultivation of turmeric and garden cultivation.

I.4.11 Sankha

This river is a tributary of the Ramganga. It takes a south-easterly direction to join the Ramganga through the central part of tahsil Bareilly as far as Khataula Beni Ram village where it is joined by the Gora nullah (which is reinforced by the surplus water of the Dhora canal near Katharra). It proceeds in the same direction as far as Gokulpur, where it turns towards the south-west, being joined a little further on near Raghupur by the Bast (a small stream) and runs through the pargana of Bareilly. It rises near Dhimri and meanders southwards left near Aina (in pargana Bareilly). It has a well-defined channel and a stiff clay bed, never changing its course or overflowing its banks and throughout its course it is

utilised for irrigation purposes. About 4 kilometres south-east of Fatehganj West it is spanned by a masonry arch bridge on the road leading to Moradabad and at a short distance downstream by a rail bridge on the main line of the Northern Railway. Still further downstream, just below the rail bridge, it has been dammed to provide irrigation to the lands on either side.

I.4.12 Deoranian

This river, which rises on the borders of the district and that of Naini Tal, enters the district near the village of Piparia Ganesh in pargana Chaumahla and wanders south-westward through the eastern extremity of the pargana of Chaumahla and the central part of pargana Richha. Near Singtra it touches the boundary of tahsil Baheri and flows along it separating it from tahsil Nawabganj as far as Dhakiya after which it forms the boundary between the tahsils of Bareilly and Nawabganj till it reaches Maheshpur Sheo Singh where it makes a bend in tahsil Nawabganj. It then runs through tahsil Bareilly and again touches its eastern boundary near Dabora Khanjanpur, separating it from tahsil Nawabganj for about two kilometres. Re-entering tahsil Bareilly about one and a half kilometres north-east of Bhojipura, it is crossed by the line of the North-Eastern Railway and the Naini Tal road to the south of the village. At Bareilly it is crossed by the Moradabad road and the Northern Railway and joins the Ramganga in the west of the city. The river has a bed of alluvial silt with banks about 4 feet high which, during the dry weather, are tilled right down to the water's edge producing good crops of maize and cotton. During the monsoon its volume swells by a considerable spill from the Dhora and it sometimes rises to a height of 10 feet, flooding the surrounding country. It is utilised for irrigation throughout its course.

I.4.13 Nakatia

This stream rises near the village of Khamaria Gopa Dandi in the south-eastern part of tahsil Baheri and flowing southward for about 3 kilometres enters tahsil Nawabganj. After traversing the western part of the tahsil, between which and that of Bareilly it forms the boundary for about a kilometre, it enters the latter near Doharia Jagir. Near the village of Aspur Khub Chand it is crossed by a bridge on the Bareilly-Pilibhit road and further south by a ferry on the road going to Bisalpur, the metalled road and the railway line of the Northern Railway leading to Shahjahanpur crossing it by bridges near Saidpur Khajuria (a village to the east of Bareilly city) and at Lakhaura (a village lying to the south of the Bareilly cantonment). To the north-east of Harauria it again flows along the boundary of tahsil Bareilly separating it from tahsil Faridpur for about a kilometre and comes quite close to the Ramganga (near the south of the village) where it enters tahsil Faridpur through which it runs in a south-easterly direction to join the Ramganga near Khalpur. It almost dries up during the summer but attains a considerable dimension by the spill from the Bahgul (East) in its upper course during the rains when it frequently floods a large area in tahsil Nawabganj. On the whole the banks of the river are gently sloping. Its bed consists of alluvial mud resting on a stratum of clay and there are deposits of *kankar* (nodular limestone) in its banks as also in the upland between it and the Deoranian. Throughout its course it is utilised for irrigation.

I.4.14 Bahgul (East)

This river, an important tributary of the Ramganga, rises in pargana Kilpuri (district Naini Tal) and after touching the district to the north of Chitauna Malhpur (a village on the northern border of the district) forms the boundary of the district for about a half kilometre. It then runs past Mundia Nabi Bukhsh, Churaila and Ataria. From the last-named place

onward it forms the boundary between the tahsils of Baheri and Nawabganj, leaving the former at Baraur and entering the latter tahsil in which it is crossed by the North-Eastern Railway to the west of the Bijauria railway station. Running southward it leaves the tahsil at the village of Kamuan and runs through the eastern part of tahsil Bareilly where it is crossed-at Manpuriya Janki Prasad-by a bridge on the road leading to Bisalpur. It leaves tahsil Bareilly at Udaipur Jasrathpur and runs through tahsil Faridpur. Flowing south-eastward it is joined on the left (at Faiznagar) by the Kandu nullah and travels southward. Further on it receives the waters of the Kailas (from the left) opposite Imalia and is joined by the Gundhia (also from the left) opposite Bhadpura. From here it forms the boundary of the district which it leaves near Fatehganj East where it is crossed by a road bridge and a rail bridge of the Northern Railway leading to Shahjahanpur. It flows between narrow limits. Its bed is sandy and in its lower reaches it has a highly fertile *khadar* area known as *chanda.* The soil above the high banks is poor in this part. Its waters are useful for irrigation and it is under the control of the irrigation department as far as Manpuriya Janki Prasad beyond which there are several earthen dams. The two weirs-One at Churaili (in pargana Richha) and the other at Girem (in pargana Nawabganj) feed the channels that are on either side of the river.

I.4.15 Kailas

This stream is formed (near the village of Mundia Chaudhari in tahsil Nawabganj) by the union of the Pangaili and the Absara and runs southward till it reaches Dandia Met Ram where it is crossed by a ferry on the unmetalled road leading from Bareilly to Bisalpur (in district Pilibhit). It then flows towards the south-west to join the Bahgul (East) on the left (opposite Imalia). It has well-defined banks of stiff clay and a sandy bed and a small *khadar* area in its lower reaches into which it extends considerably during the monsoon.

I.4.16 Pangaili

This stream rises in pargana Jahanabad (in district Pilibhit) and forms the boundary of the district adjacent to the village of Sali Jagir and then again between the villages of Dhaiya Bojh and Arsia Bojh after which it enters the district and runs for a short distance through tahsil Baheri. It then flows through pargana Nawabganj leaving it near Khajuria and enters the district again near Mianpur (a village in tahsil Nawabganj). Further on it is crossed by a bridge on the North-Eastern Railway to the east of the railway station of Bijauria and then by the Pilibhit road at the town of Nawabganj, the Banarsi nullah joining it about three kilometres south-east of the town. From here it flows through the tahsil till it reaches Mundia Chaudhari where it is joined by the Absara to form the Kailas.

I.4.17 Absara

This stream (which is also known as Apsara, Apsareha or Afsarha) rises in the Naini Tal District. Traversing Jahanabad in district Pilibhit, it first touches the district at Adhkata Nazrana and then flows on to the north of Nawadia Qassab where it enters tahsil Nawabganj after forming the boundary of the district for about one and a half kilometres. Running through the district for about three kilometres it again forms the boundary of the district as far as the village of Abhairajpur where it again leaves the district. Once again entering the district to the north of Mohammadpur, it flows south-westward through tahsil Nawabganj till it reaches Mundia Chaudhari where it meets the Pangaili to form the Kailas.

I.4.18 Gundhia

This stream (which is also known as Guneya or Sohania) rises near Budhauli in pargana Faridpur and flows through the pargana as far as Ghulupura after which it forms the boundary between the district and that of Shahjahanpur till it joins the Bahgul (East) on the left opposite Bhadpura.

I.4.19 Deoha

This is a large and important river which touches the district to the north-east of Bahir Jagir (a village in tahsil Nawabganj) and runs southwards separating the district from that of Pilibhit as far south as Jarpa Mohanpur (in tahsil Faridpur) where it leaves the district. It touches the district again in the north-east of Shaikhapur (in tahsil Faridpur) and, forming the boundary of the district for about eight kilometres (to separate it from district Pilibhit) finally leaves the district near the village of Maholia Jalalpur. It becomes fordable during the hot season when its maximum discharge is 200 cubic feet per second but it becomes swollen during the rains due to violent floods when the maximum discharge becomes 26,000 cubic feet per second. As its bed is broad and much below the level of the surrounding terrain, it is not much useful for irrigation but its *khadar* is extensive and fertile.

I.4.20 Aril

This river, which is the chief tributary of the Ramganga (on its right bank), rises in district Moradabad and touches the district of Bareilly in the south-west of Gularia Aral. It then forms the southern boundary at Sirauli (tahsil Aonla) which it separates from the district of Badaun for about twenty kilometres. After reaching the village of Chakarpur Gahi at which it enters the district, it runs southeastward through tahsil Aonla. At Mau Chandpur it is crossed by the road going from Aonla to Sirauli and near Deokola it is joined by the

Pairiya and further on, at Phulasi, it supplies water to the Nawab Nadi or Amis. It then flows on in the same direction as far as Lohari. Near Darwarpur it bifurcates to reunite near Bagarpur where it leaves the district after enclosing a large area, the road from Aonla to Bhamora crossing the right and the left branches at Sendha and Kuddha, respectively by means of ferries. Its valley is a well-defined depression about one and a half kilometres in breadth in its upper reaches where the flow from the high ground on either bank is rapid but it is extensively utilised for irrigation near Aonla where it debouches on a wide and level plain of stiff clay. The villagers have dammed it at Deokola and Attar Chandi and there are also two smaller dams in the lower reaches of its course.

I.4.21 Bahja

This stream (which is a small tributary of the Aril) rises near Bisharatganj and traversing pargana Sanha leaves the district at Serohi.

I.4.22 Andheria

This is also a small stream (also an affluent of the Aril) which rises in pargana Ballia, and leaves the district at Gharra.

I.4.23 Pairiya

This river rises in the swamps near Gurha in the north of pargana Sirauli and runs southward to join the Aril on the left near Deokola. Its bed is well-defined as, there is an abrupt rise to the sandy uplands on the west but to the east the ground is low and covered with swamps.

I.4.24 Nawab Nadi

This stream is a canal from the Aril which was dug during the days of Ali Mohammad Khan, the Rohilla Chief (1737-1754) to supply water for his elephants and cattle when Aonla was the capital of the Rohillas. It emerges from the Aril near the village of Phulasi and then runs southward, and takes a southeasterly course in the east of Aonla to join the right branch of the Aril at Danpur. The channel has silted up but carries water during the rains as a result of which the area traversed by it suffers from waterlogging. To the north of Aonla the stream is crossed by a bridge on the Aonla-Bareilly road which was also made by Ali Mohammad Khan.

I.4.25 Lakes

There are several Lakes (locally known as *dabris)* along the Ramganga and the Bahgul (West), the largest being Lilaur Buzurg and Surla each being about a hundred acres in area. Other lakes are at Ashokpur (46 acres), J erh (19 acres) and Richha (17 acres), all of which are in tahsil Faridpur. Among other lakes which deserve mention are Ballia, Kiara Mustakil and Gauntara and Daulatpur in tahsil Faridpur. There are others which usually dry up during the winter and none is used for irrigation purposes.

I.5 GEOLOGY

Geologically the district forms a part of the Indo-Gangetic alluvium, which consists of sand, clay, *kankar* and *reh.* The foot-hills of the Siwaliks lie about 120 to 130 kilometres to the north and the east of the city of Bareilly. The presence of boulders in the northern part of the district in the river beds at a depth of 10 feet or less, indicate that in the not very remote past the Himalayan detritus found its way farther south than observed at present.

As regards the nature and depth of the alluvium, the data obtained from several borings in it indicate the presence of coarse sand and sandy silt with occasional beds of clay and *kankar* to a depth of 250 feet.

I.5.1 Reh

This mineral is rare in the district and the quantity obtained is insignificant.

I.5.2 Kankar

This is also scarce and is practically absent in the northern part of the district, the deposits elsewhere being poor. The chief quarries are at Fatehganj East and between Bareilly and Bhojpura on the Naini Tal road.

I.5.3 Clay

Clay (suitable for making bricks, earthen toys and, utensils) is found almost everywhere in the, district, especially near Bareilly.

I.6 CLIMATE

The climate of the district is the same as that in the other sub-Himalayan districts in the State. It is influenced by the district's proximity to the hills and the *tarai* swamps to the north. Although the air is dry in summer it contains moisture during the rest of the year. There are four seasons. The cold season, from December to February, is followed by the summer which continues till about the middle of June. The south-west monsoon then ushers in the rainy season which lasts till the end of September, October and November constitute the post-monsoon season.

I.6.1 Rainfall

The district has nine raingauge stations-Aonla, Baheri, Bareilly, Dhaiya Bojh, Faridpur, Kundra, Mirganj, Nawabganj, and Pandhera with records ranging from 68 to 97 years. The details of the rainfall at these stations and for the district as a whole are given in Table I.2. The rainfall generally increases from the south-west towards the north-east, the annual rainfall varying from 982.1 mm. (38.66") at Aonla (in the south-west corner of the district) to 1259.7 mm. (49.60") at Baheri (in the north). About 87 per cent of the annual rainfall is received during the monsoon season, July being the month with the maximum rainfall. The normal rainfall in the district is 1102.0 mm. (43.39") but the variation (from year to year) is appreciable. During the period from 1901 to 1950, the heaviest rain, amounting to 167 per cent of the normal, fell in 1936 and the lowest in 1918 when it was only 57 per cent of the normal. During the same period there were 11 years when the rainfall was less than 80 per cent of the normal, no.2 being consecutive but at individual stations, 2 or 3 consecutive years of such low rainfall occurred. At Pandhera 5 and 6 consecutive years of low rainfall occurred during 1937-41 and 1943--48, respectively. At Kundra 8 consecutive years of rainfall-less than 80 per cent of the normal-occurred during the period 1937-44 and in 32 years the annual rainfall in the district was between 900 mm. (35.43") and 1,400 mm. (55.12"). The heaviest rainfall in 24 hours recorded at any station in the district was 533.4 mm. (21.00") at Nawabganj on July 7, 1882. A statement regarding the frequency of the annual rainfall in the district is given below for the period 1901-50.

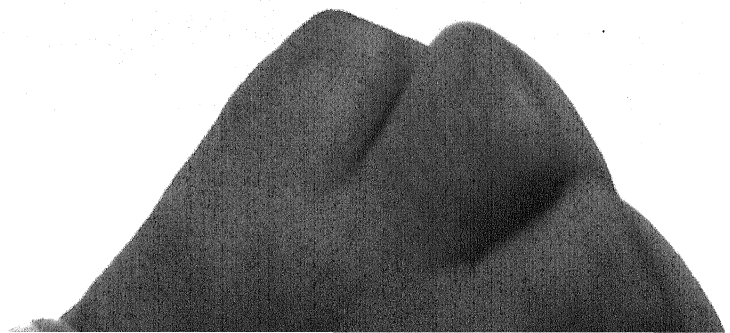

Table I.2 : **Rainfall in Bareilly District**

Ranges in mm.	Number of years
0601-0700	4
0701-0800	4
0801-0900	8
0901-1000	9
1001-1100	6
1101-1200	8
1201-1300	5
1301-1400	4
1401-1500	1
1501-1600	8
1601-1700	1
1701-1800	1
1801-1900	1

On an average there are 46 rainy days (days with rainfall of 2.5 mm. or more) in a year, the variation in different parts of the district being negligible.

I.6.2 Temperature

There is a meteorologioal observatory at Bareilly the records of which may be taken as representative of the meteorological conditions in the district. From about the middle of November, temperatures decrease rapidly and in January (the coldest month), the mean daily minimum .temperature is 8.1°C. (46.5°F.) and the mean daily maximum 21.6°C. (70.9°F). In association with the cold waves in the wake of western disturbances passing eastward, the minimum temperatures may go down to the freezing point of water and frosts may occur. Temperatures rise rapidly after February. May and early June constitute the hottest period of the year. In May the mean daily maximum temperature is 39.7°C. (103.5°F.) and the mean daily minimum 25.2°C. (77.4°F.). The hot dry and often dusty westerly winds (known as *"loo"*) make the heat more intense but rarely blow after sunset. Thunderstorms usually follow dust-storms in this period and bring some relief from the heat.

The hot winds usually cease by mid June when, with the advance of the south-west monsoon, day temperatures drop appreciably but nights continue to be as warm as in the summer. The increased humidity during the rainy season causes general oppressiveness. During breaks in the rains in September, day temperatures increase slightly. In October nights become cool although day temperatures continue to be as high as in the monsoon season. The highest maximum temperature recorded at Bareilly was 46.7°C. (116.1°F.) on May 29, 1884, and the lowest minimum temperature was 0.0°C. (32°F.) on February 2, 1905.

I.6.3 Humidity

The air is very humid in the monsoon season and to a lesser extent when the monsoon is over. There is a considerable decrease in humidity in the cold season. The summer season is the driest part of the year when the humidity in the afternoon can be as low as 20 per cent.

I.6.4 Cloudiness

During the monsoon season the skies are heavily clouded, particularly in July and August but during the rest of the year they are clear or lightly clouded except for short spells during the cold season when, in association with the passing western disturbances, they become cloudy.

I.6.5 Winds

Winds are generally light or calm in the mornings. Westerlies and north-westerlies are more common from October to April. By May the wind region is reversed and east and south-west winds predominate thereafter and continue during the rainy season. The mean

wind speed for the district in kilometres per hours 2.6 in January, 3.4 in February, 4.3 in March, 4.5 in April, 5.0 in May, 5.0 in June, 3.9 in July, 3.1 in August, 2.9 in September, 1.8 in October, 1.5 in November and 2.1 in December, the mean annual speed being 3.3.

I.6.6 Special Weather Phenomena

During the summer months the district experiences dust-storms and thunderstorms, with occasional squalls. In the monsoon months, the rain is often associated with thunderstorms which also occur in association with spells of inclement weather during the winter when fog is fairly common. A statement regarding the frequency of the special weather phenomena month-wise for the district has been presented in Table I.3.

Table I.3 : Special Weather Phenomena in the District

Months	Mean Number of Days with				
	Thunder	Hail	Dust Storm	Squall	Fog
January	1.4	0.1	0.0	0.0	7.0
February	3.0	0.3	0.0	0.1	2.0
March	1.3	0.0	0.0	0.1	0.3
April	2.0	0.0	0.3	0.1	0.0
May	4.0	0.2	0.7	0.1	0.0
June	4.0	0.0	0.6	0.1	0.0
July	6.0	0.0	0.1	0.0	0.1
August	5.0	0.0	0.1	0.0	0.1
September	5.0	0.0	0.1	0.0	0.0
October	0.8	0.0	0.0	0.0	0.2
November	0.3	0.0	0.0	0.0	3.0
December	0.6	0.0	0.0	0.0	9.0
Annual	33.4	0.6	1.9	0.5	21.7

I.7 FLORA

The district forms a part of the tropical thorn type of the vegetation division but it is practically devoid of any extensive natural vegetation cover. The total area of forest in the district was 226 hectares in 1999-2000. The chief varieties of trees found in the forests and

wastelands of the district are *shisham (Dalbergia sissoo), babul (Acacia arabica),* dhak *(Butea monosperma), haldu (Adina cordifolia)* and *kachnar (Bauhinia variegata).*

The district has a small area under forest but it has a large number of trees which have been planted in and around village sites, alongside of roads and in the form of orchards and groves, presenting a well wooded appearance. These groves consist chiefly of mango trees (which provide both fruit and timber). Other trees found throughout the district are *jamun (Eugenia jambolana* or *Syzygium cumini),* neem *(Azadirachta indica), siris (Albizzia lebbek), sated siris (Albizzia procera), gular (Ficus glomerata), pipal (Ficus religiosa), pakar (Ficus infectoria* or *Ficus lacor), bargad or* banyan *(Ficus bengalensis),* guava *(Psidium guajava),* orange *(Citrus aurantium),* litchi *(Litchi sinensis),* peach *(Prunus persica),* bel *(Aegle marmelos), mahua (Madhuka indica), khirni (Manilkara hexandra), aonla (Emblica officinalis)* and *kathal (Artocarpus heterophyllus).* The groves are usually surrounded by hedges of bamboo which grows abundantly in the district. In some places there are avenues of ornamental trees along the roads, the chief being that of eucalyptus *(Eucalyptus* spp.), *ashok (Polyalthia longifolia), gul mohal (Delonix regia)* and *kanakchampa (Pterospermum acerifolium).*

I.8 FAUNA

In former days a large number and variety of wild animals was found in the district, most of which was covered with forests and grass lands. The *tarai* forest belt extended as far as the south of Kabar and a vast forest stretched from Aonla to Badaun covering the valley lying to the west of the Ramganga, which for centuries remained the hunting preserves. It is said that -Firuz Shah Tughluq (1351-1388) prohibited the land in this area from being brought under the plough in order to preserve it as a hunting-ground. Due to

the increasing pressure of population the forests of the district were gradually cleared and the lands brought under cultivation, leaving a very small area under forest, the number and variety of the wild animals in the district consequently diminishing considerably. The wolf *(Canis lupus)* is usually found in tahsil Nawabganj and is also sometimes seen in the tahsils of Bareilly and Faridpur. The *nilgai (Boselaphus tragocamelus),* which damages the standing crops, is found in the villages adjoining the Ramganga in the northern part of tahsil Aonla. The *chital* or spotted deer *(Axis axis)* is found throughout the district. The tiger *(Panthera tigris),* panther, leopard or *guldar (Panthera pardus)* visit the northern fringes of the district from the adjoining districts of Naini Tal and Pilibhit. The jackal *(Canis aureus), para (Axis porcinus), sahi (Hystrix leucura),* sambar *(Cervus unicolor)* and fox *(Vulpes bengalensis)* are found throughout the district. Wild boar *(Sus cristatus)* is found in the beds of the Kichha and the Deoha and is also seen in the thick groves of bamboo and thorn in the northern part of the district.

I.9 BIRDS

Among the game birds the most common are the grey partridge *(Francolinus pondiceriancis),* common quail *(Coturnix. coromandelicus),* black partridge *(Francolinus francolinus)* and the florican *(Sypheotides indica).* the last-named occasionally being found in tahsil Baheri. The common snipe *(Cappella gallinago)* is found in abundance in the winter. The goose *(Anser anser),* common teal *(Anas Crecca)* , red-crested pochard duck *(Netta rufina).* white-eyed pochard *(Aythya rufa)* and widgeon *(Mareca penelope)* visit the district in the winter and inhabit the fringes of rivers, lakes and swamps. Some other birds which are commonly found in the district are the little grebe *Podiceps ruficollis);* spotbill *(Anas poecilorhyncha),* common peafowl *(Pavo cristatus),* blue rock pigeon *(Columba livia).* Indian ring-dove *(Streplopelia decaocto),* spotted dove *(Streptopelia chinensis),* little

cormorant *(Phalacrocorax. nigher),* snake-bird *(Anhinga melanogaster),* grey heron *(Ardea cinerea),* pond heron *(Ardeola grayii),* cattle egret *(Bubulcus ibis),* black kite *(Milvus migrans)* sparrow hawk *(Accipiter nisus),* griffon vulture *(Gyps fulvus),* parakeet *(Psittacula),* cuckoo *(Cuculus micropterus), koel (Eudynamis scolopaceus),* mottled wood owl *(Strix ocellatum),* night jar *(Caprimulgus asiaticus),* common king-fisher (A*lcedo atthis),* blue jay, *(Coracias benghalensis),* hoopoe *(Upupa epops),* black drongo *(Dicrurus macrocercus),* jungle myna *(Aethiopsar fucus)* house crow *(Corvus splendens)* and yellow-throated sparrow *(Gymnorhis xanthocollis).*

I.10 REPTILES

Snakes are common in the district especially in the rural areas, the chief being the cobra *(Naja naja),* krait *(Bungarus caeruleus)* and rat-snake *(Ptyas mucosus).* Of sauria the most important is the monitor lizard which is found in the northern parts. The *gharial (Gavialis gangeticus)* and mugger *(Crocodilus palustris),* which were formerly found in the Ramganga, have now become extinct, partly as the result of indiscriminate shooting and partly due to the silting up of the bed *of* the river.

I.11 FISH

Fish are found in the rivers, *jhils,* ponds and artificial reservoirs of the district, the common species being *rohu (labeo rohita), karonch (Labeo calbasu), khursa (Labeo gonious), nain (Cirrhina mrigala), calla (Catla catla), rewa (Cirrhina reba), sol (Ophiocephalus marulius), girai (Ophiocephalus punctatus),. patra (Notopterus notopterus), tengra (Mystus seenghala), parkin (Wallagonia attu)* and *singhi (Hete-ropneustis fossilis).*

CHAPTER – II

POPULATION AND LAND RESOURCES

It is evident that on account of population growth, severe depletion and exploitation of land resources like forest, pasture land, etc. has taken place in the past. In this chapter, characteristics of population and land resources have been analysed in case of Bareilly district.

II.1 POPULATION

The total population of Bareilly district was 28,34,616 in 1991 Census which constituted 2.03 per cent in the population of the State. The males constituted 54.37 per cent and females 45.63 per cent in the population of the district. The gap between the population of males and females was lower by 2.07 per cent in the district than the state. The rural population was 67.21 per cent and urban was 32.79 per cent. The Scheduled Castes population was 12.66 per cent in the district in comparison with 21.05 per cent Scheduled Castes population in the state. The population of Scheduled Tribes was only 0.02 per cent in the district. The sex ratio was 839 in the district as against 879 in the State. The density of population was 688 persons per square kilometre in the district as against 473 persons in the State. In Table II.1, general population characteristics of the Bareilly district along with of the State have been shown.

Table II.1: **Population Characteristics of Bareilly District and Uttar Pradesh: 1991 Census**

Sl.No.	Items	Bareilly	Uttar Pradesh	Bareilly District as % of Uttar Pradesh
1.	Population	2834616 (100.00)	139112000 (100.00)	2.04
2.	Male	1541086 (54.37)	74037000 (53.22)	2.08
3.	Female	1293530 (45.63)	65075000 (46.78)	1.99
4.	Rural	1905151 (67.21)	11150600 (80.16)	1.71
5.	Urban	929465 (32.79)	27606000 (19.84)	3.37
6.	Scheduled Castes	358934 (12.66)	29276455 (21.05)	1.23
7.	Scheduled Tribes	427 (0.02)	287901 (0.21)	0.15
8.	Sex Ratio	839	879	
9.	Density (Per Sq.Km.)	688	473	

Note : Figures in bracket indicate the percentage.
Source: Census Handbook, 1991.

II.2 POPULATION IN AGE GROUPS

The age-wise classification of population of Bareilly district in terms of males and females and rural and urban was made in Table II.2. It becomes evident from this table that the population in the age-group of 0-4 years constituted 14.35 per cent. It was 13.51 per cent in case of males, 15.34 per cent of females, 15.05 per cent in rural areas and 12.90 per cent in urban areas. The population in the age group of 5-14 years was 22.79 per cent of males, 27.26 per cent of females and 22.53 per cent of the both. It was 23.24 per cent in rural population and 27.35 per cent in urban population. The population in the age group of 15-39 years was 38 per cent of males, 33 per cent of females and 38 per cent of all

persons. It was 37 per cent and 39 per cent in rural and urban population respectively. No major variation was evident in the population of higher age groups in the district.

Table II.2: **Age-wise Classification of Population in Bareilly District: 1991 Census**

Age Group	Male	Female	Total	Rural	Urban
0—04	208200 (13.51)	198428 (15.34)	406628 (14.35)	286725 (15.05)	119903 (12.90)
05—09	224075 (14.54)	194029 (15.00)	418104 (14.75)	284249 (14.92)	133855 (14.40)
10—14	196488 (12.75)	158587 (12.26)	355075 (12.53)	234715 (12.32)	120360 (12.95)
15—19	154879 (10.05)	110467 (8.54)	265346 (9.36)	168606 (8.85)	96740 (10.41)
20—24	129451 (8.40)	110985 (8.58)	240436 (8.48)	160604 (8.43)	79832 (8.59)
25—29	114811 (7.45)	101154 (7.82)	215965 (7.62)	143648 (7.54)	72317 (7.78)
30—39	188167 (12.21)	161433 (12.48)	349600 (12.33)	227094 (11.92)	122506 (13.18)
40—49	139160 (9.03)	111114 (8.59)	250274 (8.83)	164986 (8.66)	85288 (5.51)
50—59	90154 (5.85)	72696 (5.62)	162850 (5.75)	111642 (5.86)	51208 (9.18)
60+	95701 (6.21)	74637 (5.77)	170338 (6.00)	122882 (6.45)	47456 (5.10)
TOTAL	1541086 (100.00)	1293530 (100.00)	2834616 (100.00)	1905151 (100.00)	929465 (100.00)

Note : Figures in bracket indicate the percentage.

Source: Census Handbook, 1991.

II.3 WORKING POPULATION

The total working population in Bareilly district was 29.16 per cent in its total population which was lower than the State level percentage of working population of 32.20. The percentage of main workers was 28.72 per cent which was close to the state level

proportion of main workers. However, the marginal workers constituted only 0.44 per cent in population of the district in comparison with 2.47 per cent of marginal workers in the population of State as the following Table II.3 shows.

Table II.3 : **Working Population in Bareilly District and Uttar Pradesh: 1991 Census**

Item	Bareilly District	Uttar Pradesh
Total Population	2834616 (100.00)	139112000 (100.00)
Total Main Workers	814147 (28.72)	41361000 (29.73)
Total Marginal Workers	12491 (0.44)	3438000 (2.47)
Total Workers	826638 (29.16)	44799000 (32.20)

Note : Figures in bracket indicate the percentage.

Source: Census Handbook, 1991.

II.4 CLASSIFICATION OF WORKERS

The classification of workers in Bareilly district showed not much difference from the composition of State level workers. Agriculture provided employment to maximum number of workers in the district as well as in the State. The share of workers engaged as cultivators had been 53.13 per cent in the district as against 53.26 per cent in the state. The percentage of agricultural labourers constituted 14.39 in the district while it was 18.94 per cent at the State level. In case of other categories of employment, much variation was evident between the district and the state as the following Table II.4 showed.

Table II.4: **Classification of Workers of Bareilly District and Uttar Pradesh: 1991 Census**

Category	Bareilly District	Uttar Pradesh
Cultivators	432580 (53.13)	22031000 (53.26)
Agriculture Labourers	117162 (14.39)	7833000 (18.94)
Animal Husbandry and Plantation	5278 (0.65)	296000 (0.72)
Industry and Mining	100 (0.01)	35000 (0.08)
Household Industry	12171 (1.49)	997000 (2.41)
Non-Household Industry	37452 (4.60)	220800 (5.34)
Construction	16209 (1.99)	511000 (1.24)
Trade & Commerce	61229 (7.53)	2551000 (6.17)
Transport, Storage and Communication	24076 (2.96)	771000 (1.86)
Other Services	107890 (13.25)	4128000 (9.98)
Total Main Workers	814147 (100.00)	41361000 (100.00)

Note: Figures in bracket indicate the percentage of Total Main Workers.

Source: Census Handbook, 1991.

II.5 LITERACY

The literacy level in Bareilly district, according to 1991 census, was lower than the state level literacy rate among total population, male and female population, rural male, female and total population and urban male, female and total population. The literacy was lower in the district in comparison with the state by 8.90 per cent, 12.43 per cent, 5.51 per cent, 15.45 per cent, 9.32 per cent, 11.96 per cent, 12.88 per cent, 11.18 per cent and 12.20 per cent in case of male, female and total population of rural, urban and all population respectively as is evident from the Table II.5.

Table II.5 : Literacy Level in Bareilly District and Uttar Pradesh: 1991 Census

(Percentage)

Item	Bareilly District	Uttar Pradesh
Population	32.70	41.60
Male	43.30	55.73
Female	19.80	25.31
Rural		
Male	36.60	52.05
Female	9.70	19.02
Total	24.70	36.66
Urban		
Male	57.10	69.98
Female	39.20	50.38
Total	48.80	61.00

Source: Census Handbook, 1991.

II.6 POPULATION GROWTH

On the basis of projected population, there would be a net addition of 15,65,760 persons in the district during the period of 1990-91 to 2009-2010. In this period, district of Bareilly would experience an increase of 64.41 per cent in its total population, 65.89 per cent in males population and 62.77 per cent in females population. In comparison to this, state will have the growth of 74.83 per cent, 77.49 per cent and 72.04 per cent in total population, males and females population respectively. In Table II.6, projection of population in case of Bareilly district and the State has been presented.

Table II.6: **Projected Population Growth in Bareilly District and Uttar Pradesh: 1990-91 to 2009-10**

Year	Bareilly District			Uttar Pradesh		
	Male	Female	Total	Male	Female	Total
1990-91	1541086	1293530	2834616	74036957	65075330	139112287
2000-01	1922833	1675868	3598701	87466301	78586558	166052859
2001-02	1969173	1718603	3687776	88367204	79891095	168258299
2002-03	2015513	1761338	3776851	89268107	81195632	170463739
2003-04	2061853	1804073	3865926	90169010	82500169	172669179
2004-05	2108193	1846808	3955001	91069913	83804706	174874619
2005-06	2154533	1889543	4044076	91970816	85109243	177080059
2006-07	2200873	1932278	4133151	92871719	86413780	179285499
2007-08	2247213	1975013	4222226	93772622	87718317	181490939
2008-09	2293553	2017748	4311301	94673525	89022854	183696379
2009-10	2339893	2060483	4400376	95574428	90327391	185901819

II.7 PER CAPITA AVAILABILITY OF LAND

The land is always fixed and can not be changed with change in its demand. When there is increase in population, per capita availability of land for various purposes would be reduced. Since the density of population in Bareilly district has been higher as compared to the density of population in the state as whole, therefore, population growth would exert more pressure on the availability of land in the district than the state. It is evident from the Table II.7 that the per capita availability of reporting area and net area sown would be lower in the district than the state during the period of 1990-91 to 2009-2010. But due to higher population density, reduction in reporting area and net area would be higher by 0.79 hectares and 0.04 hectares respectively in Bareilly district in comparison with 0.50 and 0.03 hectares of reduction in reporting area and net area sown at the State level.

Table II.7. **Per Capita Availability of Reported Area and Net Cultivated Area in Bareilly District and Uttar Pradesh**

Year	Bareilly District			Uttar Pradesh		
	Estimated Population of Bareilly District	Per Capita Availability of Land		Estimated Population of Uttar Pradesh	Per Capita Availability of Land	
		Reported Area (Hect.)	Net Cultivated Area (Hect.)		Reported Area (Hect.)	Net Cultivated Area (Hect.)
1990-91	2834616	0.144	0.115	139112287	0.175	0.119
2000-01	3598701	0.113	0.917	166052859	0.146	0.101
2001-02	3687776	0.110	0.090	168258299	0.144	0.100
2002-03	3776851	0.108	0.088	170463739	0.142	0.099
2003-04	3865926	0.105	0.086	172669179	0.140	0.098
2004-05	3955001	0.103	0.084	174874619	0.138	0.097
2005-06	4044076	0.101	0.082	177080059	0.137	0.096
2006-07	4133151	0.099	0.081	179285499	0.135	0.095
2007-08	4222226	0.097	0.079	181490939	0.133	0.095
2008-09	4311301	0.095	0.078	183696379	0.132	0.094
2009-10	4400376	0.093	0.076	185901819	0.130	0.093

II.8 LAND HOLDINGS : NUMBER

In Bareilly district, number of marginal and small holdings in total holdings constituted 86.79 per cent during 1985-86. While such type of holdings had 90.83 per cent share in total holdings of the state. Thus, the number of marginal and small holdings in total holdings in Bareilly district was lower by 4.04 per cent in the district than the state. However, there would be reversal in this trend in the district due to population growth in future which may lead to faster fragmentation of land holdings in the district than in the state as whole. The projection of number of holdings in the Bareilly district and Uttar Pradesh upto 2009-2010 as shown in Table II.8 indicates that during 2009-2010, share of number of marginal and small holdings in total holdings of the district would become 92.76

per cent while the percentage of both these holdings at the state level would be 90.80. Thus, the process of marginalization of holdings would be faster in the district as compared with the state during the period of 1985-86 to 2009-2010.

Table II.8: **Number of Holdings in Bareilly District and Uttar Pradesh : 1985-86 to 2009-10**

(Number in thousand)

Year	Bareilly				Uttar Pradesh			
	Marginal	Small	Medium & Large	Total	Marginal	Small	Medium & Large	Total
1985-86	236 (69.20)	60 (17.59)	45 (13.21)	341 (100.00)	13782 (72.59)	2964 (15.61)	2239 (11.80)	18985 (100.00)
1990-91	264 (71.54)	63 (17.08)	42 (11.38)	369 (100.00)	5663 (31.52)	4391 (24.44)	7912 (44.04)	17966 (100.00)
1995-96	283 (72.94)	64 (16.49)	41 (10.57)	388 (100.00)	14819 (73.82)	3118 (15.53)	2137 (10.65)	20074 (100.00)
2000-01	290.35 (74.69)	61.95 (15.93)	36.45 (9.38)	388.75 (100.00)	15017.55 (74.49)	3103.25 (15.39)	2038.90 (10.12)	20159.70 (100.00)
2001-02	291.82 (75.04)	61.54 (15.82)	35.54 (9.14)	388.90 (100.00)	15057.26 (74.63)	3100.30 (15.37)	2019.28 (10.00)	20176.84 (100.00)
2002-03	293.29 (75.39)	61.13 (15.71)	34.63 (8.90)	389.05 (100.00)	15096.97 (74.76)	3097.35 (15.34)	1999.66 (9.90)	20193.58 (100.00)
2003-04	294.76 (75.73)	60.72 (15.60)	33.72 (8.67)	389.20 (100.00)	15136.68 (74.89)	3094.40 (15.31)	1980.04 (9.80)	20211.12 (100.00)
2004-05	296.23 (76.08)	60.31 (15.49)	32.81 (8.43)	389.35 (100.00)	15176.39 (75.03)	3091.45 (15.28)	1960.42 (9.69)	20228.26 (100.00)
2005-06	297.70 (76.43)	59.90 (15.38)	31.90 (8.19)	389.50 (100.00)	15216.10 (75.16)	3088.50 (15.25)	1940.80 (9.59)	20245.40 (100.00)
2006-07	299.17 (76.78)	59.49 (15.27)	30.99 (7.95)	389.65 (100.00)	15255.81 (75.29)	3085.55 (15.23)	1921.18 (9.48)	20262.54 (100.00)
2007-08	300.64 (77.13)	59.08 (15.16)	30.08 (7.71)	389.80 (100.00)	15295.52 (75.42)	3082.60 (15.20)	1901.56 (9.38)	20279.68 (100.00)
2008-09	302.11 (77.47)	58.67 (15.04)	29.17 (7.49)	389.95 (100.00)	15335.23 (75.56)	3079.65 (15.17)	1881.94 (9.27)	20296.82 (100.00)
2009-10	303.58 (77.82)	58.26 (14.94)	28.26 (7.24)	390.10 (100.00)	15374.94 (75.68)	3076.70 (15.15)	1862.32 (9.17)	20313.96 (100.00)

Note : Figures in bracket indicate the percentage.
Source: Sankhyakiya Patrika.

II.9 LAND HOLDINGS: AREA

The skewed pattern of distribution of land area under different type of holdings is common feature in the State. In Bareilly district, area under marginal and small holdings

had been 51.72 per cent while the same was 51.61 per cent at the state level. By 2009-2010, area under marginal and small holdings would be 63.21 per cent in the district while the same would be 65.99 per cent at the state level as the following table II.9 shows.

Table II.9: **Area of Different Holdings in Bareilly District and Uttar Pradesh : 1985-86 to 2009-10**

(Thousand Hectares)

Year	Bareilly District						Uttar Pradesh					
	Marginal	Small	Medium & Large	Medium	Large	Total	Marginal	Small	Medium & Large	Medium	Large	Total
1985-86	89.40 (26.76)	83.40 (24.96)	95.30 (28.53)	57.30 (17.15)	8.70 (2.60)	334.10 (100.0)	4993.3 (28.29)	4114.9 (23.32)	4313.1 (24.44)	3377.4 (19.14)	849.5 (4.81)	17648.2 (100.0)
1990-91	98.20 (30.23)	87.50 (26.94)	87.70 (27.00)	44.60 (13.73)	6.80 (2.10)	324.80 (100.0)	5653.3 (31.43)	4390.7 (24.41)	4206.7 (23.39)	3042.0 (16.91)	694.0 (3.86)	17986.7 (100.0)
1995-96	105.60 (31.77)	90.00 (27.08)	86.40 (25.99)	44.80 (13.48)	5.60 (1.68)	332.40 (100.0)	6023.4 (34.02)	4214.5 (23.81)	4101.30 (23.17)	2799.7 (15.82)	562.30 (3.18)	17701.2 (100.0)
2000-01	113.55 (33.32)	92.55 (27.16)	85.10 (24.97)	45.00 (13.20)	4.60 (1.35)	340.80 (100.0)	6644.7 (37.04)	4265.05 (23.78)	4000.80 (22.30)	2560.35 (14.27)	467.30 (2.61)	17938.2 (100.0)
2001-02	115.14 (33.62)	93.06 (27.17)	84.84 (24.77)	45.04 (13.15)	4.40 (1.29)	342.48 (100.0)	6768.96 (37.64)	4275.16 (23.77)	3980.70 (22.13)	2512.48 (13.97)	448.30 (2.49)	17985.6 (100.0)
2002-03	116.73 (33.92)	93.57 (27.18)	84.58 (24.58)	45.08 (13.10)	4.20 (1.22)	344.16 (100.0)	6893.22 (38.23)	4285.27 (23.76)	3960.60 (21.96)	2464.61 (13.67)	429.30 (2.38)	18033.0 (100.0)
2003-04	118.32 (34.21)	94.08 (27.20)	84.32 (24.38)	45.12 (13.05)	4.00 (1.16)	345.84 (100.0)	7017.48 (38.81)	4295.38 (23.76)	3940.50 (21.79)	2416.74 (13.37)	410.30 (2.27)	18080.4 (100.0)
2004-05	119.91 (34.51)	94.59 (27.22)	84.06 (24.19)	45.16 (12.99)	3.80 (1.09)	347.52 (100.0)	7141.74 (39.40)	4305.49 (23.75)	3920.40 (21.63)	2368.87 (13.06)	391.30 (2.16)	18127.8 (100.0)
2005-06	121.50 (34.79)	95.10 (27.23)	83.80 (24.00)	45.20 (12.95)	3.60 (1.03)	349.20 (100.0)	7266.0 (39.98)	4315.60 (23.74)	3900.30 (21.46)	2321.00 (12.77)	372.30 (2.05)	18175.2 (100.0)
2006-07	123.09 (35.08)	95.61 (27.25)	83.54 (23.81)	45.24 (12.89)	3.40 (0.97)	350.88 (100.0)	7390.26 (40.56)	4325.71 (23.74)	3880.20 (21.29)	2273.13 (12.47)	353.30 (1.94)	18222.6 (100.0)
2007-08	124.68 (35.37)	96.12 (27.26)	83.28 (23.62)	45.28 (12.84)	3.20 (0.91)	352.56 (100.0)	7514.52 (41.13)	4335.82 (23.73)	3860.10 (21.13)	2225.26 (12.18)	334.30 (1.83)	18270.0 (100.0)
2008-09	126.27 (35.64)	96.63 (27.28)	83.02 (23.44)	45.32 (12.79)	3.00 (0.85)	354.24 (100.0)	7638.78 (46.70)	4345.93 (23.73)	3840.00 (20.96)	2177.39 (11.89)	315.30 (1.72)	18317.4 (100.0)
2009-10	127.86 (35.92)	97.14 (27.29)	82.76 (23.25)	45.36 (12.75)	2.80 (0.79)	355.92 (100.0)	7763.04 (42.27)	4356.04 (23.72)	3819.90 (20.80)	2129.12 (11.60)	296.30 (1.61)	18364.8 (100.0)

Note : Figures in bracket indicate the percentage.
Source: Sankhyakiya Patrika.

The above analysis revealed that the population of Bareilly district constituted 2.03 per cent of the State's population. The population of Scheduled Castes was 13 per cent in the district as against 21 per cent in the State. The sex ratio was found to be lower but population density was higher in the district in comparison with the State's. The age-wise classification of population in the district did not show much difference from the State level scenario. The total workers and marginal workers had been lower in the population of district in comparison with the State's. However, the share of main workers was nearly the same in the district as well as the State. The composition of different workers was also more or less same in the district as that in the State. The level of literacy among different population groups was lower in the district in comparison with the State. The population projection upto 2009-2010 showed that increase in population in Bareilly district would be lower than that of the increase at the State but due to higher population density in the district, per capita availability of land would become lower in the district in comparison with the State. The skewed pattern of land distribution both in terms of number of land holdings and area would remain the feature of agricultural land ownership in the district.

CHAPTER III

TRENDS AND PROJECTIONS IN LAND USE PATTERN

It is important to understand that given the present growth in population what would be its impact on future land use pattern in Bareilly district. In other words, it is to be examined that what would be the trends in land use pattern of Bareilly district during ten years or so, assuming the present pattern to continue. In this chapter, changes in different type of land uses in Bareilly district after every five years starting from 1980-81 to 2000-2001 have been examined. Besides, a projection of changes in different uses of land upto 2009-10 has also been presented.

III.1 TRENDS IN LAND USE PATTERN

The total reporting area in Bareilly district was 4.07 lakh hectares in 1980-81 and no change in its size was evident upto 2000-2001. The land area under forest was quite low in the district. Its share in the reporting area was 0.10 per cent in 1980-81 and during subsequent periods, the area of forest remained below the level of 1980-81. The area of barren land constituted 3.23 per cent in reporting area during 1980-81. It increased nominally in 1985-86. During 1990-91 and 1995-96, its area declined substantially but during 2000-2001, area of barren land increased again, raising its share to 2.62 per cent in reporting area. Land put to non-agricultural uses was found to be the second most important land use in the district after net area sown. Its share in reporting area was around 10 per cent in 1980-81 which increased to 12.30 per cent during 2000-2001. Area of culturable waste was around 1 per cent in reporting area in 1980-81, 1985-86 and

2000-2001. But in 1990-91 and 1995-96, substantial increase in the area of culturable waste was contributed by the reclamation of barren land in these years. The area of permanent pasture and miscellaneous trees was less than half per cent in reporting area of the district. Land area under both these uses did not indicate any increasing trend over the years. The land under other fallow remained 1 to 2 per cent of the reporting area during the entire period. The net area sown in the Bareilly district was found to be in between 80 to 82 per cent during the period 1980-81 to 2000-2001. In Table III.1, trend in land use pattern of Bareilly district has been presented.

Table III.1: **Trends in Land Use Pattern of Bareilly District**

(Ha.)

Land Use Category	1980-81	1985-86	1990-91	1995-96	2000-2001
Reporting Area	407260 (100.00)	407490 (100.00)	407525 (100.00)	407490 (100.00)	407490 (100.00)
Forest	411 (0.10)	226 (0.06)	298 (0.07)	313 (0.08)	226 (0.06)
Barren Land	13151 (3.23)	13268 (3.26)	2892 (0.95)	3700 (0.90)	10710 (2.62)
Land Under Non-Agricultural Uses	39260 (9.64)	41996 (10.31)	44141 (10.83)	46842 (11.50)	50107 (12.30)
Culturable Waste	4253 (1.04)	3561 (0.87)	12655 (3.10)	10256 (2.52)	2108 (0.52)
Permanent Pasture	409 (0.10)	457 (0.11)	408 (0.10)	564 (0.14)	801 (0.20)
Miscellaneous trees	919 (0.23)	1301 (0.32)	3119 (0.77)	2215 (0.54)	2339 (0.57)
Current Fallow	12350 (3.03)	9322 (2.29)	8722 (2.14)	7549 (1.85)	6523 (1.50)
Other Fallow	4055 (1.00)	5762 (1.41)	7068 (1.74)	7612 (1.87)	4639 (1.14)
Net Area Sown	332452 (81.63)	331597 (81.37)	327222 (80.30)	328439 (80.60)	330037 (80.99)

Note: Figures in bracket indicate the percentage.

On the whole, changes in land use pattern of Bareilly district during the period 1980-81 to 2000-2001 indicated that land under forest, barren land, culturable waste,

current and other fallow had declining trend. The area used for non-agricultural purposes showed increasing trend. There had been nominal increasing trend in the area used for permanent pasture and miscellaneous trees. The net sown area had remained mostly stagnant during the period.

III.2 CHANGES IN AREA UNDER DIFFERENT LAND USES

In this section, it has been analyzed that how much changes could occur in different type of land uses within a period of five years. The period considered for the exercise is 1980-81 to 1985-86, 1985-86 to 1990-91, 1990-91 to 1995-96 and 1995-96 to 2000-2001. The analysis as shown in Table III.2 revealed that there was negligible shift in the reporting area of Bareilly district during all the periods. The area under forest showed a heavy decline of 45.01 per cent during the year 1985-86 over 1980-81. In subsequent two periods, it had positive growth. However, in 2000-2001 over 1995-96, forest area again had a negative growth of 27.80 per cent. The area of barren land had nominal positive growth during the year 1985-86 over 1980-81. But during the two subsequent periods, area of barren land had negative growth. During the year 2000-2001 over 1995-96, area of barren land had a high positive growth. There had been constant upward growth in the area used for non-agricultural purposes by 5 to 7 per cent during all the four periods considered here. The area of culturable waste showed negative growth in the year 1985-86 over 1980-81, 1995-96 over 1990-91 and 2000-2001 over 1995-96. It had substantial positive growth in 1990-91 over 1985-86. The area under pasture had demonstrated positive growth during the periods analyzed here except in the year 1990-91 over 1985-86 when it had negative growth. The area under miscellaneous trees showed the positive trend except in the year 1995-96 over 1990-91 when it had negative growth. The area of current fallow showed a

declining negative growth during the entire periods but the area of other fallow had positive growth upto 1995-96. In 2000-2001 over 1995-96, area of other fallow had negative shift of 39.06 per cent. The net area sown had shown negligible negative and positive changes over the years.

Table III.2: Period-wise Shift in Area Under Different Land Use Categories in Bareilly District

(Hect.)

Land Use Category	1985-86 over 1980-81	1990-91 over 1985-86	1995-96 over 1990-91	2000-01 over 1995-96
Reporting Area	230 (0.06)	35 (0.01)	-35 (-0.01)	--
Forest	-185 (-45.01)	72 (31.86)	15 (5.03)	-87 (-27.80)
Barren Land	117 (0.89)	-9376 (-70.67)	-192 (-4.93)	7010 (189.46)
Land Under Non-Agricultural Uses	2736 (6.97)	2145 (5.11)	2701 (6.12)	3265 (6.97)
Culturable Waste	-692 (-16.27)	9094 (255.38)	-2399 (-18.96)	-8148 (-79.45)
Permanent Pasture	48 (11.74)	-49 (-10.72)	156 (38.24)	237 (42.02)
Miscellaneous trees	382 (41.57)	1818 (139.74)	-904 (-28.98)	124 (5.60)
Current Fallow	-3028 (-24.52)	-600 (-6.44)	-1173 (-13.45)	-1026 (-13.59)
Other Fallow	1707 (42.10)	1306 (22.67)	544 (7.70)	-2973 (-39.06)
Net Area Sown	-855 (-0.26)	-4375 (-1.32)	1217 (0.37)	1598 (0.49)

Note: Figures in bracket indicate the percentage.

III.3 GROWTH IN AREA OF DIFFERENT LAND USES

The growth rates in different land use categories of Bareilly district were worked out for the period of 1980-81 to 1990-91, 1990-91 to 2000-2001 and taking into account the entire period of 1980-81 to 2000-2001. The results have been shown in Table III.3. The

table showed that the reporting area in the district had negligible positive growth during the first and the third periods. During the second period, it showed negligible negative growth. There had been negative growth in the forest area of the district during all the three periods. The area under barren land showed negative growth during the first and third period but during 1990-91 to 2000-2001, it had positive growth of 17.52 per cent. The land under non-agricultural uses demonstrated positive growth during all the periods. The area of culturable waste showed positive growth during the period 1980-81 to 1990-91 but it experienced negative growth during the later periods. The area under permanent pasture had negative growth of 0.02 per cent during 1980-81 to 1990-91 but later on it developed negative growth of 8.33 per cent and 2.52 per cent during 1990-91 to 2000-2001 and 1980-81 to 2000-2001 respectively. The area of miscellaneous trees showed positive growth of 23.94 per cent during 1980-81 to 1990-91 but in the subsequent period of 1990-91 and 2000-2001, it had negative growth of 2.50 per cent. During the entire period of twenty years, i.e., 1980-81 to 2000-2001, area of miscellaneous trees had positive growth of 7.73 per cent. The area of current fallow showed negative growth of around 3 per cent during each of the three periods. The other fallow had positive growth of 7.43 per cent during 1980-81 to 1990-91. During 1990-91 to 2000-2001, area of other fallow experienced negative growth of 3.44 per cent. The area under other fallow showed a positive growth of 0.72 per cent during the period of 1980-81 to 2000-2001. The net area sown of the district did not experience any noticeable change during the periods considered for the analysis. During 1980-81 to 2000-2001, net area sown in the Bareilly district had negative growth of 0.04 per cent. Thus, during the period of twenty years, area under forest, barren land, culturable waste, current fallow and net area sown had negative

growth while land under non-agricultural uses, pasture, miscellaneous trees and other fallows experienced positive growth in Bareilly district.

Table III.3: Growth Rate in Area Under Different Land Use Categories in Bareilly District

Land Use Category	1980-81 to 1990-91	1990-91 to 2000-01	1980-81 to 2000-01
Reporting Area	0.01	-0.001	0.003
Forest	-2.75	-2.42	-2.25
Barren Land	-7.04	17.52	-0.93
Land Under Non-Agricultural Uses	1.24	1.35	1.38
Culturable Waste	19.76	-8.33	-2.52
Permanent Pasture	-0.02	9.63	4.79
Miscellaneous trees	23.94	-2.50	7.73
Current Fallow	-2.94	-2.52	-2.36
Other Fallow	7.43	-3.44	0.72
Net Area Sown	-0.16	0.09	-0.04

III.4 PROJECTION OF LAND USE PATTERN OF THE DISTRICT

By taking into account the past changes in different uses of land in Bareilly district, a projection was made in Table III.4 to find out the future trend in land use pattern in the district from 2000-2001 to 2009-2010. On the basis of the projection as shown in Table III.4, it became evident that the percentage of forest area in reporting area of the district would remain at a very low level of 0.04 to 0.06 per cent during the entire period. The area of barren land would remain at 2.62 per cent and a gradual increase will be witnessed in the area used for non-agricultural purposes from 2000-2001 to 2009-2010. The area of culturable waste would witness successive decrease from 0.52 per cent in 2000-2001 to 2009-2010. A slow decrease in the area of pasture, miscellaneous trees, current fallow and

other fallow would also be witnessed in the district during each year from 2000-2001 to 2009-2010. The percentage of net area sown which had been 80.99 in 2000-2001 will slowly increase during each year to reach to 81.58 per cent in 2009-2010.

Table III.4 : **Projection of Area Under Different Land Use Categories in Bareilly District**

(Ha.)

Land Use Category	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Reporting Area	407490 (100.00)	407490 (100.00	407490 (100.00	407490 (100.00	407490 (100.00	407490 (100.00	407490 (100.00	407490 (100.00	407490 (100.00	407490 (100.00
Forest	226 (0.06)	217 (0.05)	208 (0.05)	199 (0.05)	191 (0.05)	182 (0.04)	173 (0.04)	165 (0.04)	157 (0.04)	149 (0.04)
Barren Land	10710 (2.62)	10704 (2.63)	10698 (2.63)	10692 (2.62)	10686 (2.62)	10680 (2.62)	10674 (2.62)	10668 (2.62)	10662 (2.62)	10656 (2.62)
Land Under Non-Agricultural Uses	50107 (12.90)	50467 (12.38)	50823 (12.42)	51134 (12.55)	51486 (12.63)	51822 (12.72)	52077 (12.78)	52299 (12.83)	52485 (12.88)	52769 (12.94)
Culturable Waste	2108 (0.52)	1922 (0.47)	1752 (0.43)	1595 (0.39)	1453 (0.36)	1324 (0.32)	1205 (0.30)	1098 (0.27)	1001 (0.25)	911 (0.22)
Permanent Pasture	801 (0.20)	848 (0.21)	896 (0.22)	947 (0.23)	1001 (0.25)	1055 (0.26)	1106 (0.27)	1169 (0.29)	1233 (0.30)	1298 (0.32)
Miscellaneous trees	2339 (0.57)	2249 (0.55)	2162 (0.53)	2078 (0.51)	1996 (0.49)	1919 (0.47)	1845 (0.45)	1773 (0.44)	1704 (0.42)	1635 (0.40)
Current Fallow	6523 (1.60)	6235 (1.53)	5958 (1.46)	5694 (1.40)	5440 (1.34)	5200 (1.28)	4968 (1.22)	4746 (1.16)	4531 (1.10)	4321 (1.06)
Other Fallow	.4639 (1.14)	4474 (1.10)	4313 (1.06)	4159 (1.03)	4011 (0.98)	3868 (0.95)	3729 (0.92)	3596 (0.88)	3464 (0.85)	3336 (0.82)
Net Area Sown	330037 (80.99)	330374 (81.08)	330680 (81.15)	330992 (81.22)	331226 (81.28)	331440 (81.34)	331713 (81.40)	331976 (81.47)	332253 (81.54)	332415 (81.58)

On the whole, it became evident that during the period 1980-81 to 2000-2001, area under forest, barren land, culturable waste, current and other fallow had declining trend. Only the area used for non-agricultural purposes indicated increasing trend. Negligible increase in the area of permanent pasture and miscellaneous trees could happen and net

area sown would remain mostly stagnant during this period. The projection analysis had revealed that the percentage of forest area in reporting area of the district would remain at a very low level of less than one per cent in reporting area during 2000-2001 to 2009-2010, if the present situation continues. The area of barren land would remain at 2.62 per cent and a gradual increase would be witnessed in the area used for non-agricultural purposes. Area of culturable waste would witness successive decline and slow decline in the area of pasture, miscellaneous trees, current fallow and other fallow would be witnessed in the district during the period. Net area sown would remain mostly stagnant during the period unless a proper plan of land use is not prepared and implemented in the district.

CHAPTER IV

IDENTIFICATION OF AREAS FOR MODEL LAND USE PLANNING: BAREILLY DISTRICT

The utilization of land for varying purposes hardly follows a standard pattern. It becomes difficult to achieve a balance unless land use plan is not prepared with careful identification of areas which require intervention. In this chapter, each of the nine classifications of land uses has been scrutinized in order to identify those areas which need model land use planning in Bareilly district.

IV.1 LAND UNDER FOREST

The forest cover in Uttar Pradesh was drastically reduced after carving out of the State of Uttaranchal. Though before formulation of Uttaranchal, land used for forest had been far lower than the standard norm in most of the plain districts of the State. In Bareilly district, area under forest has been quite lower in comparison with the norm of 30 per cent share of forest area in reporting area as recommended in the National Forest Policy. Keeping in view the progress of State Forest Department in increasing the forest area in different districts of State including Bareilly district, it did not seem possible that forest area would increase to the level of 30 per cent in the reporting area of the district during coming ten years or so. However, there is need to divert land from other uses for afforestation to increase the forest cover in the district and it requires a proper planning.

IV.2 BARREN LAND

The area of barren land in Bareilly district requires proper planning for its utilization in the near future. According to the officials of Department of Agriculture, around 35 per

cent of total barren land is not usable with the given level of technology of barren land reclamation. For the reclamation and use of rest of the area of barren land, Department of Agriculture and World Bank aided Sodic Land Reclamation Project are engaged. Keeping in view their past performance, it is to be decided that how much area of the barren land can be treated for different uses.

IV.3 LAND UNDER NON-AGRICULTURAL USES

The land used for non-agricultural purposes is increasing due to urbanisation and industrialisation. It is one of the important symbols of development in the present society. In Bareilly district, around 12 per cent of the reporting area was under non-agricultural uses by 2000-2001 and it showed increasing trend. Therefore, demand of land for non-agricultural purposes is to be met from other categories of land. It is evident from the observation that generally agricultural land has been diverted for non-agricultural uses. In this situation, growth in the area of non-agricultural uses is to be planned. It is also to be looked into the possibility of using of non-agricultural land for other purposes.

IV.4 CULTURABLE WASTE

The area of culturable waste constituted less than one per cent of the reporting area in Bareilly district. In comparison with the State, its share is lower in the district. Keeping in view the growth in demand of land for varying purposes, area of culturable waste can be utilised for cultivation, for increasing forest cover and for non-agricultural purposes. Therefore, culturable waste land required proper planning in the district for its possible use during the coming years.

IV.5 PERMANENT PASTURE LAND

The area of pasture land is around less than one per cent in the reporting area of Bareilly district. During the last years, there has been some decline in this area. But keeping in view the population of livestock in the district, further reduction in the area of pastures would become undesirable. Therefore, in the proposed Model Land Use Plan of Bareilly district, area of pasture land would not be touched for any other uses. It will be proposed to remain the same to the level of 2000-2001 during each year upto 2009-2010.

IV.6 AREA UNDER MISCELLANEOUS TREES

There has been negligible increase in the area under miscellaneous trees during the past years in the district. A slow increase in the area under miscellaneous trees also acted as pull factor for increasing forest area in the district. Actually the area under miscellaneous trees constituted the area of old orchards, new orchards and scattered trees. On the whole, cutting of trees has adverse environmental impact. Thus, from both view points, i.e. afforestation and environment, it is proposed that the area of miscellaneous trees would be maintained at the level of 2000-2001 in the district.

IV.7 FALLOW LAND

The share of both type of fallow land had been substantial in the district. In the proposed land use plan, a framework for the management of fallow land would be devised so that fallow land could be diverted for cultivation and other uses.

IV.8 NET AREA SOWN

The percentage of net area sown in reporting area of Bareilly district had been around 81 per cent in 2000-2001 and the same proportion is continuing since 1980-81.

Though as compared to the State level, share of net sown in the district has been higher but proposed plan of utilisation of other uses of land would have impact on the net area sown of the district.

On the basis of above, following seven (7) categories of land uses in the district require planning for their proper utilization upto 2009-2010:

(i) Planning for Forest Area.

(ii) Planning for Barren Land.

(iii) Planning for Land Under Non-Agricultural Uses

(iv) Planning for Culturable Waste.

(v) Planning for Current Fallow.

(vi) Planning for Other Fallow.

(vii) Planning for Net Area Sown.

CHAPTER – V

LAND USE PLANNING IN BAREILLY DISTRICT

The analysis carried so far has indicated that the utilization of land for various purposes has been improper, resulting into its under-use or over-use for different purposes. For example, area under forest has been quite low in the district than the prescribed norm. Land area used for non-agricultural purposes reached to 12 per cent of the reporting area by 2000-2001. All this necessitated to draw up a proper plan of land utilization in the district. In this chapter, a model land use plan of each of the nine uses of land of Bareilly district has been prepared.

V.1 PLAN FOR FOREST DEVELOPMNET

The land area under forest in Bareilly district had been very nominal in its reporting area. During two decades of 1980-1981 to 2000-2001, percentage of area under forest never exceeded one per cent. Certainly, it has been quite lower in comparison with the recommended level of 30 per cent of the forest area in reporting area as laid down in the National Forest Policy. Though there is no possibility that forest cover in Bareilly district could be increased to such a high level but there is need of a plan to gradually enlarge the forest area in the district during coming ten years to so. One important point needs to be mentioned here that the Department of Forest, Government of Uttar Pradesh had defined the meaning of forest area from reserve forest to tree cover. All the land area covered under various trees including the area of reserve forests would now be treated the forest area. Therefore, in the proposed model land use plan, area under forest would imply the tree cover, incorporating the area of reserve forest as well as the area covered by the trees.

Thus, the fact is that there is need to increase the land area under forest but such increase can not be possible unless a proper plan is proposed which will guide that how much area of a particular land use could be diverted for forestation during successive years on the basis of past growth in its area and view points of the officials of Department of Forest. On the basis of both these considerations, following plan to increase tree cover in Bareilly district has been drawn up.

The net area shown is the most suitable land for afforestation. But large scale forestation programme on net area sown would be practically not feasible. Therefore, it is to be decided that during each year how much area of the net sown area could be used for afforestation. There are marginal, small, medium and large farmers. A fix percentage of net area sown can not be decided in case of each category of these farmers for increasing tree cover because the preference of different type of farmers may vary across different size of land owned by them. Though, it would be better to decide a fix area of net area sown on which new trees could be planted during each year. But in respect of different land size groups, different size of area is to be planned for the purpose. As shown in Table V.1, 0.50 per cent of the net area sown of Bareilly district during each year from 2000-2001 to 2009-2010 has been decided to be used for afforestation. But as mentioned that on the basis of views of the forest and agricultural department officials, 0.11 per cent area of holdings in the size of less than one hectare, 0.54 per cent of holdings of 1-2 hectares, 0.81 per cent of holdings of 2-4 hectares, 1.08 per cent of holdings in size of 4-10 hectares and 1.35 per cent of holdings in size of 10 hectares and above would be earmarked for plantation during each year.

Table V.1 : **Plan to Increase Tree Cover on Net Sown Area in Bareilly District**

Land Size Group	Percentage of Area Proposed for Tree Cover
Less than One Ha.	0.11
1 – 2 Ha.	0.54
2 – 4 Ha.	0.81
4 – 10 Ha.	1.08
10 Ha. and above	1.35
Total	0.50

The barren land would also be used for increasing tree cover in the district. The officials at the Directorate of Agriculture, Uttar Pradesh were in view that around 35 per cent of the barren land is generally worthless for cultivation and plantation. Therefore, 35 per cent of the barren land has been excluded from the existing area of barren land while considering the utilization of barren land in the district. It has been decided to use four per cent of the 65 per cent of the barren land each year from 2000-2001 to 2009-2010 for new forestation.

Land under non-agricultural uses has been increasing in the district because of growing urbanization. Around ten per cent of the reporting area has been put to various non-agricultural uses by 2000-2001. As per view of the officials of Forest Department, it would be feasible to use 0.50 per cent of the total area used for non-agricultural purposes for tree cover during each year from 2000-2001 onwards in the district.

Culturable waste is such type of land that despite being worth of cultivation is not used for cultivation. The Department of Forest has planned to use 6.50 per cent of the total culturable waste for afforestation in the State. However, keeping in view the past performance of Department in this regard, it is proposed to use 1.50 per cent of the culturable waste for afforestation in the district during each year upto 2009-2010.

The area under pasture land is lowest among all uses of land except forest in the district. Keeping in view the population of livestock in the district, it is proposed to maintain the existing area of pasture without diverting it for afforestation and other uses.

The area under miscellaneous trees includes the area under old/new orchards and scattered trees. It is expected that due to better return from horticulture during the years to come, more and more farmers would be attracted for horticulture. Therefore, land area which will come under miscellaneous trees would add to forest cover but it would be treated as separate land use category.

The fallow land is of two types. One is the current fallow which has been left uncultivated during the current agricultural season. The other is the old fallow which has remained uncultivated during last 3-4 years. It is proposed to use 1.50 per cent of existing area of both fallow land. The share of each fallow land in 1.50 per cent would be determined by the proportionate share of each fallow land in total fallow land of the district.

On the basis of above plan, total area proposed for increasing tree cover in Bareilly district would be as shown in Table V.2.

Table V.2: **Area of Different Land Uses which is to be used for Tree Cover in Bareilly District Upto 2009-2010**

(Hect.)

Year	Net Sown Area	Barren Land	Land under Non-Agricultural Uses	Culturable Waste	Current Fallow	Other Fallow	Existing Forest Area	Total Area Proposed for Tree Cover (2 to 8)	Percentage of Reporting Area
1	2	3	4	5	6	7	8	9	10
2000-01	--	--	--	--	--	--	226	--	0.06
2001-02	1650	278	251	32	65	46	226	2548	0.63
2002-03	1640	262	254	30	62	44	2548	4840	1.19
2003-04	1629	246	258	29	60	43	4840	7105	1.74
2004-05	1618	232	262	28	57	41	7105	9343	2.29
2005-06	1607	218	266	26	55	39	9343	11554	2.84
2006-07	1596	205	270	25	52	37	11554	13739	3.37
2007-08	1585	193	274	24	50	36	13739	15901	3.90
2008-09	1574	182	278	23	48	34	15901	18040	4.43
2009-10	1563	171	282	22	46	33	18040	20157	4.95

It is evident from the table that the tree cover in Bareilly district would increase by mere 0.06 per cent in 2001-2002. It will gradually increase in successive years to reach to the level of 4.95 per cent of reporting area in 2009-2010. Despite it, Bareilly district would continue to have low level of tree cover during coming ten years.

The proposed plan of increasing tree coverage in Bareilly district should be achieved mainly through people's participation. The Department of Forest should provide expertise to grow seedlings. However, an estimated amount of Rs.5.00 would be the expenditure per seedling. On this basis, estimated financial requirement would be Rs.1,27,72,000 during the first year, on the basis of need of 11000 seedlings per hectare. The year-wise estimate cost of increasing additional area under tree cover has been shown in Table V.3.

Table V.3 : **Estimated Financial Requirement for the Proposed Area of Tree Cover of Bareilly District from 2001-02 to 2009-2010**

Year	Total Area (Ha.)	Total Seedling Required (No.)	Rate of Seedlings (Rs.)	Total Cost (Rs.)
2001-02	2322	2554200	5.00	12771000
2002-03	2292	2521200	5.00	12606000
2003-04	2265	2491500	5.00	12457500
2004-05	2238	2461800	5.00	12309000
2005-06	2211	2432100	5.00	12160500
2006-07	2185	2403500	5.00	12017500
2007-08	2162	2378200	5.00	11891000
2008-09	2139	2352900	5.00	11764500
2009-10	2117	2328700	5.00	11643500

V.2 PLAN OF BARREN LAND USE

The barren land is comprised of two types, one is the barren land which is rocky and ravineous and cannot be used for cultivation and growing any sort of vegetation. The other part of barren land is the usar and degraded. This part of barren land can be treated and put to use. The officials of the Department of Agriculture held the view that around 35 per cent of the total barren land in the state is not suitable for any use and remaining 65 per cent of barren land can be treated for varying uses. On the basis of discussion with the officials of Agriculture Department, following plan of barren land use is proposed for the Bareilly district.

As explained in the last section that 4 per cent of the 65 per cent of the reclaimable part of barren land was earmarked for afforestation to increase tree cover in the district from 2000-2001 to 2009-2010. Thus, from the reclaimable area of barren land of each year, 4 per cent would be subtracted to arrive at the net available area of reclaimable barren land.

The area of barren land, thus, arrived at can not be treated at one time. The Department of Agriculture and Bhumi Sudhar Nigam have been engaged in the reclamation of barren land. The efforts put in by both the Departments in this direction have resulted in the reduction of barren land by nearly 1.16 per cent per year during the period 1995-96 to 2000-2001. However, the officials of these departments were in view that during the years to come, roughly 2 per cent of the reclaimable barren land would be treated. On this basis, it has been assumed here that the reclaimable area of barren land in Bareilly district would decline by 2 per cent per year during the period of 2001-2002 to 2009-2010. On an average, 100 hectares would be the reduction in area of barren land per year, during the period 2000-2001 to 2009-2010 in Bareilly district. In Table V.4, plan of barren land use for the period 2000-2001 to 2009-2010 of Bareilly district has been presented.

Table V.4 : **Proposed Plan of Barren Land Use in Bareilly District**

(in Ha.)

Year	Barren Land	Rocky and Ravenous (35% of Barren Land)	Reclaimable Barren Land	Barren Land Diverted for Tree Cover	Barren Land Available for Reclamation	Proposed for Reclamation	Remaining Barren Land	Net Barren Land Available (3+8)	Percentage of Barren Land in Reporting Area
1	2	3	4	5	6	7	8	9	10
2000-01	10710	--	--	--	--	--	--	--	2.62
2001-02		3749	6961	278	6683	134	6549	10298	2.53
2002-03		3749	6549	262	6287	126	6161	9910	2.43
2003-04		3749	6161	246	5915	118	5797	9546	2.34
2004-05		3749	5797	232	5565	111	5454	9203	2.26
2005-06		3749	5454	218	5236	105	5131	8880	2.18
2006-07		3749	5131	205	4926	99	4827	8576	2.10
2007-08		3749	4827	193	4634	93	4541	8290	2.03
2008-09		3749	4541	182	4359	87	4272	8021	1.97
2009-10		3749	4272	171	4101	82	4019	7768	1.91

V.3 PLAN OF LAND AREA UNDER NON-AGRICULTURAL USES

Land area used for various non-agricultural purposes constituted around 12 per cent of the reporting area by 2000-2001 in the district. If the growth in the area under non-agricultural uses is examined, it showed a positive growth during the period 1980-81 and 2000-2001. Thus, on the basis of land use data published by the Directorate of Agriculture, it can be inferred that the area under non-agricultural uses indicated a definite upward trend during the last twenty years. According to the Master Plan of Bareilly, 2001, prepared by the Town and Country Planning, Department of Uttar Pradesh, land used for non-agricultural purposes in urban areas of the Bareilly district experienced a growth of 61.13 per cent during 1987-2002. On this basis, land put to non-agricultural uses in urban areas of the district had an annual growth of 4.07 per cent per annum during the last 15 years. It is the fact that constituents of the land used for various non-agricultural purposes in rural and urban areas are the housing, commercial, offices, industries, recreation/ park/play-ground facilities, utility and services, transport, river and open spaces. Taking into account the growth of population in the district and past growth in the area used for various non-agricultural purposes in urban areas of the district, it has been assumed here that land area put to various non-agricultural uses would have a positive annual growth of 2 per cent each year upto 2009-2010. It is to be now considered that which of the uses of land would be diverted to meet the 2 per cent growth in area of non-agricultural uses each year upto 2009-2010. It has been assumed here that current fallow, other fallow and net area sown are the three components of land, from which land would be diverted to meet the growth of 4 per cent in the area used for non-agricultural purposes. The areas of current fallow, other fallow and net area sown are proposed to be diverted to non-agricultural uses as per their proportionate shares in the land use pattern of the district.

On the above basis, area put to use of various non-agricultural purposes which was 50107 hectares in 2000-2001 would increase to 56404 hectares during 2009-2010, indicating a growth of 12.58 per cent during this period. Its share in the reporting area would also increase from 12.30 per cent in 2000-2001 to 14.05 per cent during 2009-2010. The year-wise increase in the area under non-agricultural uses of Bareilly district from 2000-2001 to 2009-2010 has been presented in Table V.5.

Table V.5: **Proposed Plan of Increase in the Area of Non-Agricultural Uses in Bareilly District**

(Hect.)

Year	Area Under Non-Agricultural Uses	Area of Non-Agricultural Uses Diverted for Tree Cover	Net Area Under Non-Agricultural Uses (2-3)	Net Area Sown to be Used for Non-Agricultural Uses	Area of Current Fallow to be used for Non-Agricultural Uses	Area of Other Fallow to be used for Non-Agricultural Uses	Total Area to be used for Non-Agricultural Uses (4 to 7)	% of Reporting Area
1	2	3	4	5	6	7	8	9
2000-01	50107	--	--	--	--	--	--	12.30
2001-02	50107	251	49856	964	19	14	50853	12.48
2002-03	50853	254	50599	979	19	14	51611	12.67
2003-04	51611	258	51353	993	20	14	52380	12.85
2004-05	52380	262	52118	1008	20	14	53160	13.05
2005-06	53160	266	52894	1023	21	14	53952	13.24
2006-07	53952	270	53682	1039	21	15	54757	13.44
2007-08	54757	274	54483	1054	21	15	55573	13.63
2008-09	55573	278	55295	1070	21	15	56401	13.84
2009-10	56401	282	56119	1085	21	16	57241	14.05

V.4 PLAN FOR CULTURABLE WASTE

The area of cultural waste in Bareilly district was 2108 hectares during 2000-2001. Keeping in view the population of landless and near landless people in the district, it would be rationale to use culturable waste land mainly for cultivation. While planning to increase tree cover in the district, it was proposed to do afforestation on 1.50 per cent of the area of culturable waste during each year from 2000-2001. But the main question remained that how much area of culturable waste can be used for agriculture. The officials of the Department of Agriculture, Government of Uttar Pradesh, expressed their satisfaction that due to one reason or other, rise in net area sown could reach to more than 81 per cent in the district of Bareilly upto 2000-2001. As far the decline in the area of culturable waste during past five years, preceeding 2000-2001 is concerned, it has been roughly by 16 per cent per annum. It was discussed with the officials of Department of Agriculture that looking into the trend of utilization of culturable waste in the past, how much area of the culturable waste should be diverted to the net area sown during each year upto 2009-2010. It was agreed upon that efforts should be made to divert around 3 per cent area of culturable waste during each year upto 2009-2010. On this basis, area of culturable waste would be reduced by 69 per cent during 2009-2010 than what was in 2000-2001. There would be a successive decline in the share of the area of culturable waste in reporting area of the district during each year from 2000-2001 to 2009-2010. The percentage of the area of culturable waste which was 0.52 in 2000-2001, would be reduced to 0.34 per cent by 2009-2010. In Table V.6, a plan of utilization of culturable waste land in Bareilly district has been presented.

Table V.6: **Proposed Plan for the Use of Culturable Waste in Bareilly District**

(Hect.)

Year	Culturable Waste	Area of Culturable Waste Diverted to Tree Cover	Area of Culturable Waste Diverted to Net Area Sown	Remaining Culturable Waste [(2-3)-4]	% of Reporting Area
1	2	3	4	5	6
2000-01	2108	--	--	--	0.52
2001-02	2108	32	62	2014	0.49
2002-03	2014	30	60	1924	0.47
2003-04	1924	29	57	1838	0.45
2004-05	1838	28	54	1756	0.43
2005-06	1756	26	52	1678	0.41
2006-07	1678	25	50	1603	0.39
2007-08	1603	24	47	1532	0.38
2008-09	1532	23	45	1464	0.36
2009-10	1464	22	43	1399	0.34

V.5 PLAN FOR THE PASTURE LAND

The area under permanent pasture has been 800 hectares in the district during 2000-2001. There has been nominal increase in this area over the years. Its share in the reporting area was 0.10 per cent in 1980-81 which increased to 0.20 per cent during 2000-2001. It is also the fact that whatever area is under pasture in the district, that is insufficient to feed the growing population of livestocks. As a result, several of the farmers have started growing various types of fodder crops on their cultivated area. It gives credence to our belief that existing area under pasture is insufficient to feed the population of livestock and any decline in this area during coming years would pose a problem of fodder in the district. Therefore, in the proposed land use plan of Bareilly district, any diversion of the area from the pastures is to be restricted and there should not be any decline in this area by 2009-2010. It is to be ensured by the revenue officials and village panchayats.

V.6 PLAN FOR THE MISCELLANEOUS TREES

The area of miscellaneous trees indicated the area of old trees/orchards as well as new trees/orchards. The area under this land use category has been nominal in the district. In 1980-81, percentage of area under miscellaneous in total reporting area was 0.23 which was increased to only 0.57 per cent during 2000-2001. During last five years since 2000-2001, area under miscellaneous trees did marginally increase. Given the small size of land area under miscellaneous trees and the importance of trees for healthy environment and meeting the needs of woods, there seems to be no logic that whatever area exists under the category of miscellaneous trees, should be diverted for other uses. Therefore, it is proposed the present area under miscellaneous trees should not be diverted for any other use in Bareilly district.

V.9 PLAN FOR CURRENT FALLOW

The area under current fallow in the district was 6523 hectares during 2000-2001. It constituted 1.50 per cent of the reporting area. There has been continuous decline in the area of current fallow in the district since 1980-81. However, still there is need that, as far as possible, area of current fallow should not be left unutilized. In the past, reduction in the area of current fallow had been by 2.36 per cent during last two decades. Considering the area of current fallow during 2000-2001 and views of the officials of Department of Agriculture, it has thought appropriate to use 3 per cent area of both fallow land (current and other fallow). The share of each of two fallows proposed for use would be divided on the basis of proportionate share of each of the fallows in total fallow land of the district. In this way, share of current fallow proposed for use in the district would be 58.44 per cent in

3 per cent of total area of both fallows. All this area would be diverted to the net sown area. Besides, 1 per cent of the area of current fallow starting from 2000-2001 has been proposed to increase tree cover. The area of current fallow would also contribute around 1.91 per cent in 2 per cent area of current and other fallows and net area sown. The detail plan of utilization of current fallow of Bareilly district has been presented in Table V.7.

Table V.7: **Proposed Plan for the Use of Current Fallow in Bareilly District**

(Hect.)

Year	Current Fallow	Area of Current Fallow Diverted for Tree Cover	Area of Current Fallow Diverted for Non-Agricultural Uses	Area of Current Fallow Diverted for Net Area Sown	Remaining Current Fallow Land {(2-3-4)-5}	% of Reporting Area
1	2	3	4	5	6	7
2000-01	6523	--	--	--	--	1.60
2001-02	6523	65	19	193	6246	1.53
2002-03	6246	62	19	185	5980	1.47
2003-04	5980	60	20	177	5723	1.41
2004-05	5723	57	20	169	5477	1.34
2005-06	5477	55	21	162	5239	1.29
2006-07	5239	52	21	155	5011	1.23
2007-08	5011	50	21	148	4792	1.18
2008-09	4792	48	21	141	4582	1.12
2009-10	4582	46	21	136	4379	1.07

V.10 PLAN FOR OTHER FALLOW

The area under other fallow signifies the land that has not been cultivated for more than three-four years. The area of other fallow land in Bareilly district was 4639 hectares in 2000-2001. Its area was 4055 hectares in 1980-81 which increased to 7612 hectares during 1995-96. Since area of other fallow has been the part of cultivated area, it is proposed to bring some of its area under cultivation during each year upto 2009-2010. On

the basis of discussion with the officials of Agriculture Department, it has been decided to allocate 3 per cent area of both fallows for cultivation during each year from 2000-2001. The share of other fallow land in 3 per cent area would constitute around 41.56 per cent. Besides, one per cent of its area would go for afforestation and 1.36 per cent of 2 per cent has been proposed for the diverting to non-agricultural uses. In Table V.8, proposed plan for the use of other fallow land has been presented.

Table V.8: **Proposed Plan for the Use of Other Fallow in Bareilly District**

(Hect.)

Year	Other Fallow	Area of Other Fallow Diverted for Tree Cover	Area of Other Fallow Diverted for Non-Agricultural Uses	Area of Other Fallow Diverted for Net Area Sown	Remaining Other Fallow Land {(2-3-4)-5}	% of Reporting Area
1	2	3	4	5	6	7
2000-01	4639	--	--	--	--	1.14
2001-02	4639	46	14	138	4441	1.09
2002-03	4441	44	14	131	4252	1.04
2003-04	4252	43	14	126	4069	1.00
2004-05	4069	41	14	121	3893	0.96
2005-06	3893	39	14	115	3725	0.91
2006-07	3725	37	15	110	3563	0.88
2007-08	3563	36	15	106	3406	0.84
2008-09	.3406	34	15	101	3265	0.80
2009-10	3265	33	16	96	3111	0.76

V.11 PLAN FOR NET AREA SOWN

A model of net area sown has emerged from the proposed plan of other uses of land in Bareilly district upto 2009-2010. As proposed earlier that 0.50 per cent of the net sown area was to be used for increasing tree cover in the district and 96.73 per cent of 2 per cent

was planned to be used for various non-agricultural purposes. It has been planned to use 2 per cent of barren land for cultivation. It has also been decided to use 3 per cent of the culturable waste and 3 per cent of both the fallows for cultivation each year. The resultant net area sown would be 310295 hectares in 2009-2010 while it was 327950 hectares during 2000-2001. In this way, share of net area sown in reporting area of the district would be gradually reduced to 76.15 per cent in 2009-2010 from 80.99 per cent in 2000-2001. In Table V.9, proposed plan of net area sown for the period 2000-2001 to 2009-2010 has been presented.

Table V.9 : **Proposed Plan for the Net Area Sown in Bareilly District**

(in Ha.)

Year	Net Area Sown	Net Area Sown Diverted for Tree Cover	Net Area Sown Diverted for Non-Agricul-tural Uses	Barren Land Added to Net Area Sown	Current Fallow Added to Net Area Sown	Other Fallow Added to Net Area Sown	Culturable Waste Added to Net Area Sown	Total Net Area Sown (2-3-4+ 5+6+7+8)	Percentage of Reporting Area
1	2	3	4	5	6	7	8	9	10
2000-01	330037	--	--	--	--	--	--	--	80.99
2001-02	330037	1650	964	134	62	193	138	327950	80.48
2002-03	327950	1640	979	126	60	185	131	325833	79.96
2003-04	325833	1629	993	118	57	177	126	323689	79.44
2004-05	323689	1618	1008	111	54	169	121	321518	78.90
2005-06	321518	1607	1023	105	52	162	115	319322	78.36
2006-07	319322	1596	1039	99	50	155	110	317101	77.82
2007-08	317101	1585	1054	93	47	148	106	314856	77.27
2008-09	314856	1574	1070	87	45	141	101	312586	76.71
2009-10	312586	1563	1085	82	43	136	96	310295	76.15

CHAPTER – VI

MODEL LAND USE PLAN OF BAREILLY DISTRICT

In this chapter, model land use plan of Bareilly district has been presented for the period 2000-2001 to 2009-2010. The model land use plan has been prepared on three considerations. First is to examine the past changes in each of the nine classifications of land use. Second is the progress and plan of the concerned departments for the management of different uses of land. Third is the assessment of situation on the basis of discussion with the concerned officials and our observation that to what extent the past trends and achievements of concerned departments would be agglomerated to arrive at the situation which should be closer to the reality.

VI.1 FRAMEWORK OF THE PLAN

The following framework was developed to prepare the Model Land Use Plan of the Bareilly District:

Table VI.1: **Framework of Model Land Use Plan of Bareilly District**

Sl.No.	Land Use Category	Constituents of Proposed Land Use Plan of each category (2000-2001 to 2009-2010)
1.	Reporting Area	Constant
2.	Forest	Existing area + 0.50 per cent area of Net Area Sown + 4 per cent area of barren land + 0.50 per cent area of Non-Agricultural Uses + 1.50 per cent area of culturable waste + 1.0 per cent area of current fallow and 1 per cent area of other fallow.
3.	Barren Land	Existing area – 35 per cent rocky and ravines – 4 per cent went to Forest – 2 per cent went to Net Area Sown.
4.	Land Under Non-Agricultural Uses	Existing area – 0.50 per cent went to Forest + 2 per cent area of current, other and net area sown (Share of 2 per cent in each category, 1.91, 1.36 and 96.73 per cent).
5.	Culturable Waste	Existing area – 1.50 per cent area went to Forest – 3 per cent area diverted went to Net Area Sown
6.	Permanent Pasture	Constant
7.	Miscellaneous Trees	Constant
8.	Current Fallow	Existing area – 1 percent went to Forest – 1.91 per cent of share of 2 per cent went to non-agricultural uses – 58.44 per cent Share of 3 per cent of both Fallows went to Net Area Sown
9.	Other Fallow	Existing area – 1 per cent area went to Forest – 1.36 per cent share of 2 per cent went to non-agricultural uses — 41.56 per cent of share of 3 per cent of both fallows went to Net Area Sown.
10.	Net Area Sown	Existing area – 0.50 per cent area went to Forest – 96.73 percent share of 2 per cent went to non-agricultural uses + 2 per cent from Barren land + 3 per cent from culturable waste and 3 per cent of both fallows.

On the basis of above framework, area under forest which is to be referred as area under tree cover, which was 0.06 per cent in 2000-2001 in Bareilly district would gradually increase in successive years to reach to 4.95 per cent in reporting area by 2009-2010. Though by 2009-2010, area under tree cover would remain far lower than the recommended level of 30 per cent as envisaged in the National Forest Policy. But further increase in the area of tree cover would be difficult to achieve in the district, taking into consideration all the factors involved.

In case of barren land, the proposed land use plan envisages gradual decline in its area in the district. Area of barren land which was 2.62 per cent in total reporting area of the district would come down to 1.91 per cent by 2009-2010.

As the urbanization and industrialisation are increasing, area under non-agricultural uses has been proposed to be increased from 12.30 per cent in reporting area of the district in 2000-2001 to 14.05 per cent by 2009-2010.

The area of culturable waste was 2108 hectares in the Bareilly district in 2000-2001. It has been planned that the area of culturable waste would be gradually converted mainly to net area sown. Its area will be reduced to 1399 hectares by 2009-2010.

In the proposed model land use plan of Bareilly district, no change in the area of permanent pasture and miscellaneous trees has been proposed.

The area under current fallow constituted 1.60 per cent in reporting area of the district in 2000-2001. A gradual diversion in this area has been planned to reduce it to the level of 1.07 per cent by 2009-2010. Similarly in case of other fallow land, diversion has been planned to minimize its area from 1.14 per cent in 2000-2001 to 0.76 per cent in reporting area of district by 2009-2010.

The proposed plan of utilisation of eight categories of land uses in the district would have impact on the net area sown. As per model land use plan of the district, net area sown would experience a gradual decline from the year 2000-2001 onwards. Its share in the reporting area of the Bareilly district was 80.99 per cent in 2000-2001 which will be reduced to 76.15 per cent by 2009-2010. In Table VI.2, complete Model Land Use Plan of Bareilly district for the period 2000-2001 to 2009-2010 has been presented.

Table VI.2: **Model Land Use Plan of Bareilly District: 2000-2001 to 2009-2010**

(Hect.)

Land Use Category	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Reporting Area	407490 (100.00)	407490 (100.00)	407490 (100.00)	407490 (100.00)	407490 (100.00)	407490 (100.00)	407490 (100.00)	407490 (100.00)	407490 (100.00)	407490 (100.00)
Forest	226 (0.06)	2548 (0.63)	4840 (1.19)	7105 (1.74)	9343 (2.29)	11554 (2.84)	13739 (3.37)	15901 (3.90)	18040 (4.43)	20157 (4.95)
Barren Land	10710 (2.62)	10298 (2.53)	9910 (2.43)	9546 (2.34)	9203 (2.26)	8880 (2.18)	8576 (2.10)	8290 (2.03)	8021 (1.97)	7768 (1.91)
Land Under Non-Agricultural Uses	50107 (12.30)	50853 (12.48)	51611 (12.67)	52380 (12.85)	53160 (13.05)	53952 (13.24)	54757 (13.44)	55573 (13.63)	56401 (13.84)	57241 (14.05)
Culturable Waste	2108 (0.52)	2014 (0.49)	1924 (0.47)	1838 (0.45)	1756 (0.43)	1678 (0.41)	1603 (0.39)	1532 (0.38)	1464 (0.36)	1399 (0.34)
Permanent Pasture	801 (0.20)	801 (0.20)	801 (0.20)	801 (0.20)	801 (0.20)	801 (0.20)	801 (0.20)	801 (0.20)	801 (0.20)	801 (0.20)
Miscellaneous trees	2339 (0.57)	2339 (0.57)	2339 (0.57)	2339 (0.57)	2339 (0.57)	2339 (0.57)	2339 (0.57)	2339 (0.57)	2339 (0.57)	2339 (0.57)
Current Fallow	6523 (1.60)	6246 (1.53)	5980 (1.47)	5723 (1.41)	5477 (1.34)	5239 (1.29)	5011 (1.23)	4792 (1.18)	4582 (1.12)	4379 (1.07)
Other Fallow	4639 (1.14)	4441 (1.09)	4252 (1.04)	4069 (1.00)	3893 (0.96)	3725 (0.91)	3563 (0.88)	3406 (0.84)	3256 (0.80)	3111 (0.76)
Net Area Sown	330037 (80.99)	327950 (80.48)	325833 (79.96)	323689 (79.44)	321518 (78.90)	319322 (78.36)	317101 (77.82)	314856 (77.27)	312586 (76.71)	310295 (76.15)

Annexure: **Land Use Pattern in Bareilly District**

(Hect.)

Year	Land Use Categories									
	Reporting Area	Forest	Barren Land	Land Under Non-Agricultural Uses	Culturable Waste	Permanent Pasture	Miscellaneous Trees	Current Fallow	Other Fallow	Net Area Sown
1972-73	407450 (100.00)	409 (0.10)	13765 (3.38)	38143 (9.36)	7654 (1.88)	376 (0.09)	5334 (1.31)	19662 (4.82)	3086 (0.76)	319021 (78.30)
1974-75	407152 (100.00)	409 (0.10)	14240 (3.50)	38428 (9.44)	6354 (1.56)	484 (0.12)	6127 (1.50)	15332 (3.77)	4146 (1.02)	321632 (78.99)
1975-76	407266 (100.00)	409 (0.10)	14312 (3.52)	38545 (9.47)	5960 (1.46)	504 (0.12)	6126 (1.50)	15029 (3.69)	4045 (0.99)	322336 (79.15)
1976-77	407353 (100.00)	411 (0.10)	14758 (3.62)	38992 (9.57)	4947 (1.22)	383 (0.09)	4786 (1.17)	7696 (1.89)	4183 (1.03)	331197 (81.31)
1977-78	407358 (100.00)	411 (0.10)	13567 (3.33)	39074 (9.59)	5070 (1.24)	361 (0.09)	4912 (1.21)	7157 (1.76)	4026 (0.99)	332780 (81.69)
1978-79	407260 (100.00)	411 (0.10)	13997 (3.43)	39478 (9.69)	4591 (1.13)	355 (0.09)	1519 (0.37)	8091 (1.99)	3336 (0.82)	335482 (82.38)
1979-80	407260 (100.00)	411 (0.10)	14667 (3.60)	39616 (9.73)	4419 (1.09)	379 (0.09)	1118 (0.27)	26007 (6.39)	3272 (0.80)	317371 (77.93)
1980-81	407260 (100.00)	411 (0.10)	13151 (3.23)	39260 (9.64)	4253 (1.04)	409 (0.10)	919 (0.23)	12350 (3.03)	4055 (1.00)	332452 (81.63)
1981-82	407271 (100.00)	411 (0.10)	12745 (3.13)	39033 (9.58)	4250 (1.04)	417 (0.10)	732 (0.18)	9512 (2.34)	4264 (1.05)	335907 (82.48)
1982-83	407497 (100.00)	410 (0.10)	12040 (3.15)	39338 (9.65)	4285 (1.05)	443 (0.11)	803 (0.20)	10269 (2.52)	4680 (1.15)	334429 (82.07)
1983-84	407490 (100.00)	410 (0.10)	12441 (3.05)	39792 (9.77)	4129 (1.01)	416 (0.10)	861 (0.21)	9869 (2.42)	4930 (1.21)	334642 (82.13)
1984-85	407490 (100.00)	226 (0.05)	13115 (3.22)	42426 (10.41)	3636 (0.89)	439 (0.11)	1104 (0.27)	10104 (2.48)	5320 (1.31)	331120 (81.26)
1985-86	407490 (100.00)	226 (0.05)	13268 (3.26)	41996 (10.31)	3561 (0.87)	457 (0.11)	1301 (0.32)	9322 (2.29)	5762 (1.41)	331597 (81.38)
1986-87	407490 (100.00)	226 (0.05)	12909 (3.17)	42250 (10.37)	3647 (0.90)	392 (0.10)	1474 (0.36)	10191 (2.50)	5957 (1.46)	330444 (81.09)
1987-88	407508 (100.00)	281 (0.07)	13247 (3.25)	42281 (10.38)	3973 (0.97)	385 (0.09)	2020 (0.50)	13043 (3.20)	6654 (1.63)	325624 (79.91)

Annexure (contd.....)

Year	Land Use Categories									
	Reporting Area	Forest	Barren Land	Land Under Non-Agricultural Uses	Culturable Waste	Permanent Pasture	Miscellaneous Trees	Current Fallow	Other Fallow	Net Area Sown
1988-89	407508 (100.00)	281 (0.07)	13116 (3.22)	43680 (10.72)	3542 (0.87)	412 (0.10)	2492 (0.61)	9388 (2.30)	6417 (1.58)	328180 (80.53)
1989-90	407508 (100.00)	281 (0.07)	12473 (3.06)	43523 (10.68)	3671 (0.90)	425 (0.11)	2851 (0.70)	9583 (2.35)	6574 (1.61)	328127 (80.52)
1990-91	407525 (100.00)	298 (0.07)	3892 (0.95)	44141 (10.83)	12655 (3.10)	408 (0.10)	3119 (0.77)	8722 (2.14)	7068 (1.74)	327222 (80.30)
1991-92	407540 (100.00)	313 (0.08)	3840 (0.94)	44799 (10.99)	12228 (3.00)	406 (0.10)	3130 (0.77)	9023 (2.21)	6763 (1.66)	327038 (80.25)
1992-93	407540 (100.00)	313 (0.08)	4170 (1.02)	45750 (11.23)	11714 (2.88)	387 (0.09)	2876 (0.71)	8662 (2.12)	6535 (1.60)	327133 (80.27)
1993-94	407490 (100.00)	313 (0.08)	3585 (0.88)	45908 (11.27)	11371 (2.79)	392 (0.10)	2949 (0.72)	9717 (2.38)	6917 (1.70)	326338 (80.08)
1994-95	407490 (100.00)	313 (0.08)	3739 (0.92)	46142 (11.32)	11612 (2.85)	383 (0.09)	2601 (0.64)	9523 (2.34)	7088 (1.74)	326089 (80.02)
1995-96	407490 (100.00)	313 (0.08)	3700 (0.90)	46842 (11.50)	10256 (2.52)	564 (0.14)	2215 (0.54)	7549 (1.85)	7612 (1.87)	328439 (80.60)
1996-97	407634 (100.00)	313 (0.08)	2299 (0.56)	46536 (11.42)	11861 (2.91)	519 (0.13)	2061 (0.51)	7349 (1.80)	7186 (1.76)	329510 (80.83)
1997-98	407490 (100.00)	226 (0.06)	2095 (0.51)	47268 (11.60)	12454 (3.05)	518 (0.12)	2279 (0.56)	7406 (1.82)	6011 (1.48)	329233 (80.80)
1998-99	407490 (100.00)	226 (0.06)	2504 (0.62)	47807 (11.73)	10342 (2.54)	542 (0.13)	2221 (0.55)	7047 (1.73)	5353 (1.31)	331448 (81.33)
1999-2000	407490 (100.00)	226 (0.06)	2312 (0.57)	49003 (12.02)	10587 (2.60)	554 (0.14)	2288 (0.56)	5492 (1.35)	5354 (1.31)	331674 (81.39)
2000-01	407490 (100.00)	226 (0.06)	10710 (2.62)	50107 (12.30)	2108 (0.52)	801 (0.20)	2339 (0.57)	6523 (1.60)	4639 (1.14)	330037 (80.99)